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THE SUGAR MANUFACTURERS' ASSOCIATION

(of Jamaica)

LIMITED

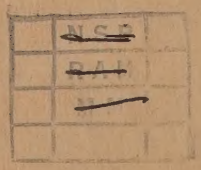
Mandeville, Jamaica, B.W.I.

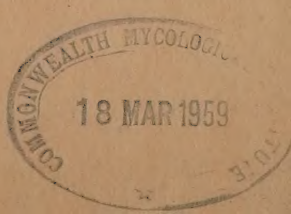
ANNUAL REPORT

OF THE

RESEARCH DEPARTMENT

1957





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THE SUGAR MANUFACTURERS' ASSOCIATION (of Jamaica) LIMITED
RESEARCH DEPARTMENT

ANNUAL REPORT, 1957

A. INTRODUCTION AND SUMMARY

1. Mr. C. E. M. Smith and Mr. P. D. Manser spent their overseas leave in the United Kingdom during which the former visited various plant breeding centres and the latter spent some time in the Pathology and Nematology Departments at Rothamsted, and visited other research institutions.

2. In January, the Director attended a meeting in Trinidad in connection with the future programme of the British West Indies Sugar Research Scheme. At this meeting, Mr. W. S. Wise was appointed successor to Dr. L. F. Wiggins as Director of the Scheme.

3. *En route* to Trinidad, the Director visited the Dominican Republic and Puerto Rico where he discussed various problems such as growing long term cane, mechanization, evaluation of farmers' cane, nematology and the use of aqueous ammonia.

4. In October, the Director attended the British West Indies Central Sugar Cane Breeding Station Advisory Committee meeting in Barbados, as well as the British West Indies Sugar Technologists' Conference and a meeting of the British West Indies Sugar Cane Investigation Committee in Antigua and St. Kitts.

5. The Advisory Committee of the British West Indies Sugar Research Scheme met in Trinidad in December and was attended by the Director.

6. The Director has been appointed Chairman of the Agricultural Section of the Tenth Congress of the International Society of Sugar Cane Technologists to be held in Hawaii in 1959.

7. The Director was nominated to serve as a member of the Scientific Research Committee recently set up by the Government of Jamaica.

8. Mr. Exley W. Steward, Field Manager of Sir J. L. Hulett and Sons, of South Africa, and Messrs. Debevoise and Osarrio of La Romana Corporation, Dominican Republic, visited the Department and some sugar estates.

9. The setting up of a Livestock Scheme for sugar estates was approved by the Directors and Members of The Sugar Manufacturers' Association (of Jamaica) Ltd., whereby up to three veterinary officers would be employed for a period of three years initially, and thereafter directly by Members of the Association with cattle interests, possibly partnered by other large cattle owners outside the sugar industry. This Department has been asked to undertake the administration of the Scheme during its first three years.

The Scheme has so far been fortunate in securing the services of Dr. D. Clay as senior veterinary officer and Dr. B. Nestel as assistant veterinary officer. It is proposed to appoint a third officer during 1958.

10. Long Pond were the hosts at an interesting and informative Field Day held in November and organized by The Jamaican Association of Sugar Technologists.

11. Three Factory Days under the auspices of the J.A.S.T. were organized. They were held at New Yarmouth on 4th June, the Citrus Factory of The Jamaica Citrus Growers' Ltd., and the Condensery of Messrs. Jamaica Milk Products Ltd., at Bog Walk, on 30th October and Kirkvine Works of Alumina Jamaica Limited on 14th November. On 20th March, Serge Island sugar factory was also visited by engineers and chemists of the industry.

12. The Annual Conference and Sectional Meetings of the J.A.S.T. were held at the Research Station in Mandeville, on 25th, 26th and 27th November, 1957, at which the following papers were presented by members of the Department:—

"Regression Analysis as Applied to some Control Data in Raw Sugar Factories," Parts 1 and 2, by R. F. Innes.

"Some Aspects of Sugar Cane Agriculture Operations," by T. Chinloy and I. deF. Smyth (of the West Indies Sugar Co. Ltd., Monymusk).

"Review of the Variety Situation in Jamaica," by C. E. M. Smith.

"Crop Logging," by H. M. Thompson.

13. A total of 3,389,442 tons cane were ground, of which 3,374,027 tons were used to manufacture the equivalent of 364,366 tons of 96° sugar at 9·26 tons cane per ton 96° sugar. Of this, estates produced 2,092,310 tons cane, or 61·7% of the island total at an average production level of 34·3 tons cane per acre on 61,139 acres—thus falling short of the record 1955 production level by 0·5 tons cane per acre (on 1,700 acres less than 1955).

14. The Cane Yield Survey for sugar estates was continued. Increased ratooning caused a drop in the overall productivity rate, viz., 6·28 cwt. sugar per acre per month, compared with the record years 1955 and 1956. In spite of this, however, some estates maintained or exceeded their productivity rate

achieved in 1956. Worthy Park produced at the rate of 8·31 cwt. sugar per acre per month, followed by United Estates (7·20) and Jamaica Sugar Estates (7·10). Caymanas, Sevens and Frome produced at greater than 6·50 cwt. sugar per acre per month, whilst Bernard Lodge, Monymusk, Serge Island, Barnett and Richmond-Llandovery exceeded 6·00 cwt. sugar per acre per month. Holland improved on their 1956 figure by 0·94, whilst Hampden and Serge Island increased their 1956 figures by more than 0·60 cwt. sugar per acre per month.

15. Monthly rainfall figures for each estate were recorded and circulated to the industry. The figures for the past three years are presented in this Report and the overall effects of rainfall during 1957 discussed.

16. Two hundred and forty-four field experiments were operated, in addition to which 124 fields were maintained under a crop log system; whilst micro plots were laid out on nearly 800 fields.

17. The merits of different sizes of overhead rainers are discussed and a case made out for the possibility of using polythene tubes instead of aluminium pipes.

18. The first ratoon results of the overhead *vs.* surface irrigation experiments confirm the plant crop figures, viz., that where water supply is adequate, surface irrigation is as effective as overhead irrigation.

19. Irrigation at a deficit of 2·0 in., equivalent to about 17 days without rainfall, proved most effective in a plant cane experiment at Monymusk.

20. An estimate was made of the deficits that would accumulate during the dry months at Frome, with a view to assessing the amount of overhead irrigation necessary.

21. Field studies on long line irrigation indicate that this system works well on heavy clay soils when land is properly graded. Planting in the furrow and subsequent moulding, planting on the bank and planting two rows on a large bank were evaluated in the same investigation. Planting on the bank was at least as good as planting in the furrow, and planting two rows on a large bank was slightly inferior although less water was required for irrigation.

22. Experiments were laid out at Caymanas, Frome and Vale Royal to evaluate the effects of trace elements.

23. The relative merits of surface and sub-surface applications of fertilizers are being evaluated.

24. Results from the fields maintained under a crop log system have indicated optimal limits for nitrogen, phosphorus and potassium in cane leaves. There appears to be a definite "boom" period of growth in cane in Jamaica.

25. Experiment results to date suggest that sulphate of ammonia is a more efficient source of nitrogen than urea. Trials are being continued and include nitrate of soda as well as ammophos.

26. Applications of sulphate of ammonia to five month old cane at Frome gave marked increases in yield.

27. The micro plots mentioned under No. 16 above, were laid out in the form of two or four plots treated with different amounts of fertilizers. Leaf samples were taken when the cane was five and seven months of age. It is proposed to reap the plots on 200 of these fields during 1958.

28. An attempt to apply solid fertilizer from the air proved abortive due to lack of proper equipment.

29. Experiment evidence suggests that when heavy rainfall precedes or occurs during or shortly after harvest, trash turning should be practised to prevent waterlogging. Inter-row cultivation appears to be beneficial if damage by heavy transport is suffered during harvest.

30. Deep cultivation, carried out by knifing, appears unnecessary under certain conditions, and in experiments being conducted at Frome, two knifings were no more effective than one knifing.

31. Benefits were derived from subsoil applications of lime, and trials are being conducted to note the effects of gypsum applications to marine clays.

32. A record of plant cane yields was kept of the trials laid down to assess the damage done by infield transport. These yields will be used for correcting variations between plots in subsequent years.

33. Root distribution studies are being carried out to indicate the nature of soil physical characteristics.

34. Appreciable losses in cane yield are experienced when B41227 and B4362 are harvested after two years instead of annually, under unirrigated conditions. These losses were not offset by extra nitrogen dressings applied at about twelve months of age.

35. A survey of the amount of effort expended in the production of cane from land preparation to arrival at the factory was carried out.

36. Fifty-one per cent. of the acreage reaped in 1957 contained the newer varieties B4362 (29%), B42231 (11%) and B41227 (21%). B4362 produced at an overall average of 6·93 cwt. sugar per acre per month, followed by B41227 at 6·59 and B42231 at 6·26 cwt. sugar per acre per month. The rapid extension of these three varieties, almost to the exclusion of any others, is clearly shown by the fact that 85% of estates' acreage in plants during 1957 was devoted to these varieties; 42% being to B41227, 27% to B4362 and 16% to B42231.

37. Soil fumigants, particularly D–D, were shown to benefit cane growth enormously compared with control or soil insecticide treatment on a "sick" area of Worthy Park. Extension of this work is being contemplated.

38. Weekly and final factory reports were collected, checked and circulated to the industry. The data are summarized in Appendix III.

39. A statistical examination of typical factory control data was carried out and suggestions made for instituting checks of accuracy.

40. Much help and co-operation has been received from all estates.

B. PRODUCTION

The total quantity of sugar manufactured was only 2,828 tons greater than in 1956, but was made from 169,465 tons more cane at an average cane quality of 9·26 tons cane per ton 96° sugar, against 8·86 in 1956. The mean production per acre for estates was 3·92 tons 96° sugar (theoretical), a figure similar to 1956 (3·90), but obtained after a growing period of 0·60 months greater than in 1956, so that production per acre per month was below that in 1956 (6·28 versus 6·54), but probably higher than the figure to be expected in 1958 because of the water shortage during the post-crop period of 1957. The latest moving five year average for productivity now stands at 6·21 cwt. sugar per acre per month, which is an all time record. By next crop the figure should have increased further to the order of 6·25. These trends are given in Figure 1:—

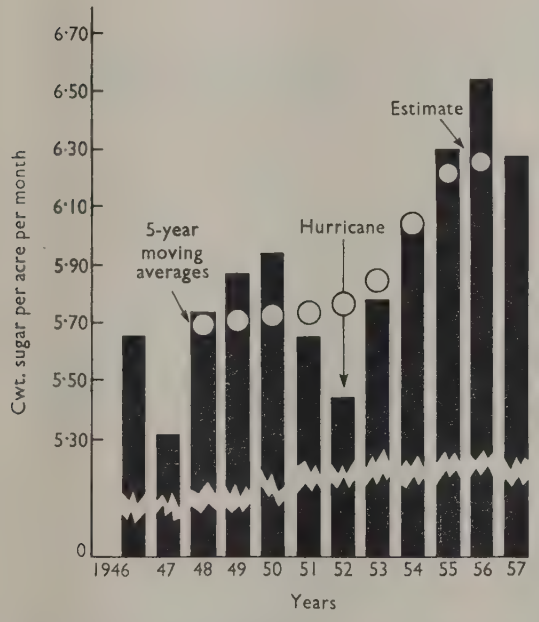


FIGURE 1

Cwt. sugar per acre per month for 1946–57 and five-year moving averages

On the whole, rate of productivity per acre suffered most on some of the irrigated estates where cane was short of water, principally because of a disappointing rainfall. A few estates registered record productivities, particularly Hampden, where the accumulated effects of an increased potash application are being felt, and Jamaica Sugar Estates, where the productivity of a large tract of hitherto marginal land has been raised by improved cultivation, fertilizer practices and the use of B4362. Worthy Park and United Estates maintained their high rates of productivity of the year before.

One of the most important features of improving productivity is to obtain an early ripening variety which will compare with B4362 in juice quality without suffering simultaneously from excessively low fibre or a bagasse of poor "burnability."

Pol % Cane

The seasonal trend in pol % cane compared with the mean curves for 1952–56 inclusive are given in Figure 2. The improvement in cane quality was particularly noticeable in the case of Gray's Inn Central, Caymanas and Bernard Lodge and to a lesser extent at Jamaica Sugar Estates and Worthy Park. At Monymusk and the North Coast estates, juice was close to the mean quality obtained over the last five years. The penalty being taken by Monymusk from cropping late in the season is clearly evident in the diagram, a position which was unfortunately aggravated by the strike. Gray's Inn Central fortunately benefited from the late start whilst Worthy Park suffered by it. Caymanas and Bernard Lodge could have benefited in juice quality from an earlier start. Since, amongst other factors, productivity, i.e., tons recoverable sucrose per acre, is clearly a function of pol % cane, estates running late crops are very likely to be operating against a productivity handicap. Statistical examination of past field records will be undertaken to examine this effect.

C. CLIMATE

The average monthly rainfall figures over the last three years for estates in their appropriate groups, are given in Table I and illustrated in Figure 3. Table II shows the number of days in each month on which average precipitation exceeded 0·5 in.

The rainfall in the months approaching harvest was excessively heavy in Group B estates (Frome, Holland and Appleton) as also was the case at Gray's Inn Central. The labour strike at Gray's Inn Central delayed their operations until the effects of the adverse rains in December and January had disappeared, whilst in Group B the heavy February rains brought about a reduction in juice quality and damage to soil tilth by infield transport at Frome. These rains also interfered with the preparation of land for planting. The North Coast estates of Group C received heavier than average spring rains, which helped tonnages greatly, especially in the case of Rose Hall. Juice at Jamaica Sugar Estates was improved by a dry spring (except May) and a very dry preceding December.

The year, as far as the 1958 crop is concerned, was very disappointingly dry in all areas. Bearing in mind quantities and distribution, the year which showed the nearest comparison in the last decade was 1952. The 1958 crop will undoubtedly be penalized especially insofar as Richmond-Llandovery, Gray's Inn Central and some irrigated estates are concerned.

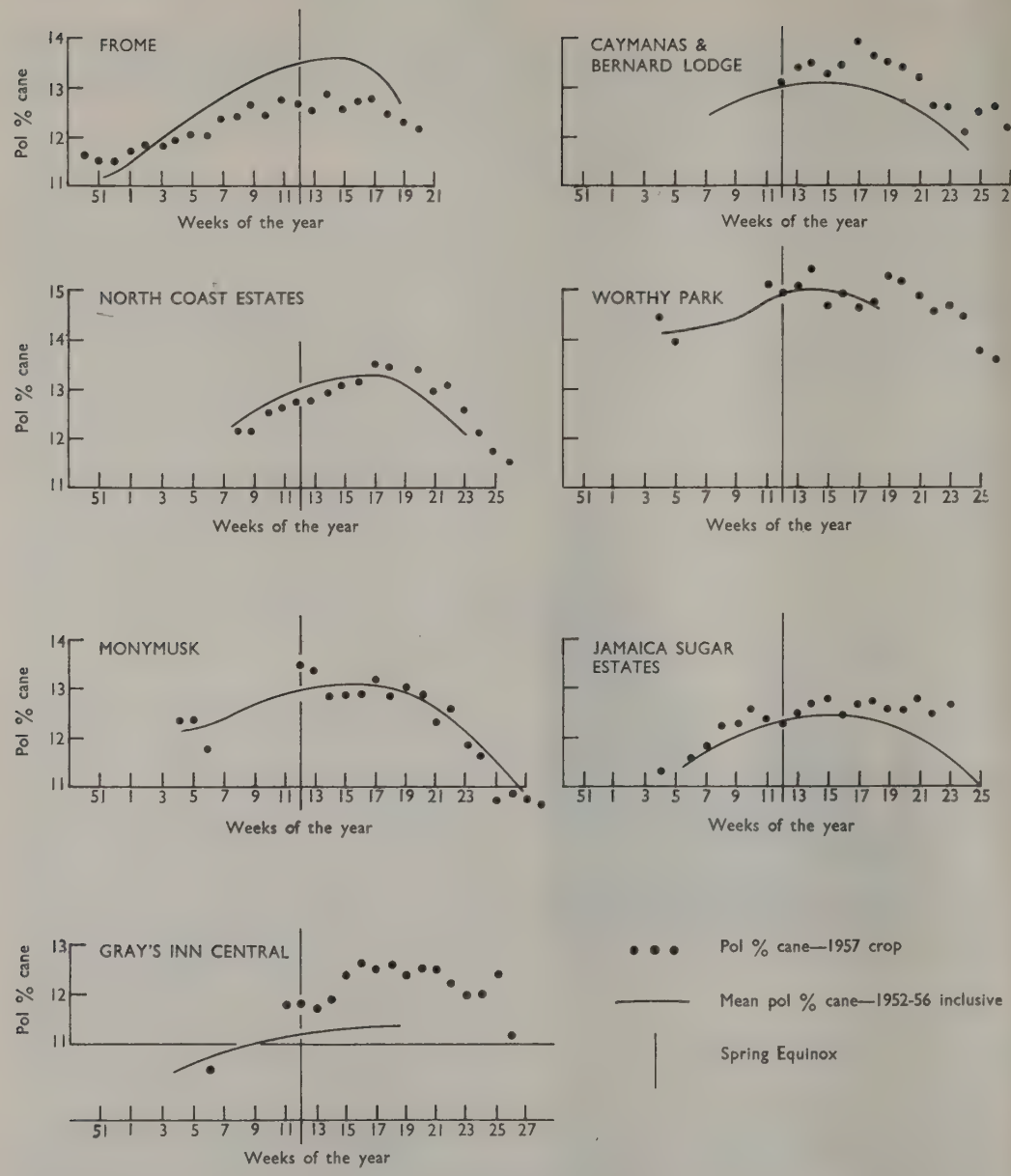


FIGURE 2

Seasonal trends in pol % cane in main ecological areas compared with corresponding mean curves for 1952–56 inclusive

TABLE I

Average Rainfall—Inches

	1955												1956												1957										
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
GROUP A:																																			
Caymanas ..	0·22	2·02	nil	2·81	2·05	7·26	3·03	6·87	6·81	4·10	1·21	1·3	0·36	0·77	1·89	2·20	1·40	1·80	4·81	2·43	1·36	13·36	3·36	0·58	0·65	0·35	2·89	2·68	5·34	0·02	0·45	1·14	4·64	5·63	0·55	0·30
Bernard Lodge ..	0·59	1·51	0·33	1·38	3·02	6·23	4·17	4·70	5·82	3·05	2·46	0·27	0·15	1·40	1·64	2·47	0·93	2·23	5·33	0·68	0·37	12·22	1·92	0·96	0·92	0·69	1·68	1·60	7·45	0·32	0·57	1·73	4·90	5165	0·55	0·33
Innswood ..	0·47	2·79	0·36	1·09	2·17	4·63	5·68	7·14	12·93	4·60	1·26	1·43	0·97	2·34	1·51	2·00	4·85	1·13	5·47	0·56	4·21	14·12	3·77	1·74	0·81	1·34	2·42	0·97	4·80	0·51	1·70	0·83	4·88	6·45	0·92	0·65
Monymusk ..	0·64	1·96	0·38	0·79	1·50	10·53	5·67	4·98	6·60	3·51	1·80	2·07	0·39	2·32	2·53	0·82	0·61	2·03	3·16	0·15	1·80	9·84	1·47	0·59	0·11	1·08	1·77	1·37	7·05	2·73	0·82	0·28	4·16	6·14	0·06	0·21
New Yarmouth ..	0·52	0·92	0·79	1·16	1·07	11·20	7·57	10·01	3·39	5·40	1·35	2·59	0·35	2·14	2·78	0·67	1·22	2·33	5·39	0·48	2·50	9·31	1·76	1·75	0·47	2·01	1·55	0·90	7·04	3·46	0·21	0·44	4·52	7·81	0·20	0·02
Sevens	0·17	3·01	2·13	2·30	4·07	8·10	6·25	5·10	6·79	5·06	1·08	2·41	nil	2·89	2·65	1·32	nil	1·66	1·33	1·13	2·45	10·58	2·58	1·72	0·65	2·00	1·67	0·68	4·09	2·28	0·20	0·87	3·54	8·57	0·81	0·58
Means	0·44	2·04	0·67	1·59	2·31	7·99	5·40	6·47	7·06	4·29	1·53	1·69	0·37	1·98	2·17	1·58	1·50	1·86	4·25	0·91	2·12	11·57	2·48	1·22	0·60	1·25	2·00	1·37	5·96	1·55	0·66	0·88	4·44	6·71	0·52	0·35
70-Year Means ..	1·53	1·47	1·90	2·58	5·73	4·79	2·15	4·44	5·54	8·72	4·99	1·79	1·53	1·47	1·90	2·58	5·73	4·79	2·15	4·44	5·54	8·72	4·99	1·79	1·53	1·47	1·90	2·58	5·23	4·79	2·15	4·44	5·54	8·72	4·99	1·79
GROUP B:																																			
Appleton	2·22	1·86	5·21	3·69	6·58	11·15	12·13	6·44	12·44	10·92	4·45	3·60	0·65	1·18	9·67	3·13	18·95	10·51	3·99	12·50	11·91	17·64	8·44	5·50	1·91	6·52	4·78	13·37	3·94	3·10	5·01	13·27	12·76	9·29	1·10	6·15
Holland	3·05	1·05	2·85	2·83	6·03	5·81	6·55	4·39	11·85	10·37	2·31	4·10	1·24	1·22	7·31	6·46	12·90	9·99	3·75	11·98	7·74	14·48	6·41	4·25	0·88	8·14	1·73	4·54	6·08	1·93	6·13	10·25	12·61	4·24	1·00	4·40
Frome	1·20	2·52	4·73	3·51	7·39	5·30	8·34	5·88	4·43	11·80	0·72	2·97	1·02	1·83	6·06	8·01	18·22	10·39	6·94	15·58	8·45	15·13	9·54	3·58	3·19	8·37	3·46	8·20	8·85	7·66	10·67	6·73	7·16	7·46	2·49	6·29
Means	2·16	1·81	4·26	3·34	6·67	7·42	9·01	5·57	9·57	11·03	2·49	3·56	0·97	1·41	7·68	5·87	16·69	10·30	4·89	13·35	9·37	15·75	8·13	4·44	1·99	7·68	3·32	8·70	6·29	4·23	7·27	10·08	10·84	7·00	1·53	5·61
70-Year Means ..	2·18	3·17	4·67	8·08	12·22	8·48	7·26	9·73	9·41	12·27	5·63	2·59	2·18	3·17	4·67	8·08	12·22	7·64	7·26	9·73	9·41	12·27	5·63	2·59	2·18	3·17	4·67	8·08	12·22	7·64	7·26	9·73	9·41	12·27	5·63	2·59
GROUP C:																																			
Barnett	3·39	1·11	nil	0·26	2·78	7·21	3·46	9·41	8·18	7·54	2·01	4·16	1·28	0·30	6·56	0·58	6·87	4·42	6·74	4·08	6·03	5·74	5·66	1·41	1·15	6·51	1·83	5·57	14·73	4·25	1·91	2·43	7·24	4·52	0·85	3·65
Rose Hall ..	3·14	2·84	0·06	0·56	1·88	9·50	1·54	5·36	7·88	4·46	1·43	4·12	0·98	2·11	1·80	1·03	2·60	2·79	2·79	1·87	2·76	8·23	8·06	1·17	1·33	6·25	1·09	0·86	5·43	2·12	0·82	2·88	4·63	6·15	0·48	3·58
Hampden ..	4·68	2·17	0·23	0·94	4·13	11·04	3·83	5·95	8·02	6·62	2·11	5·24	1·63	0·66	6·84	3·20	7·40	3·43	4·82	4·19	5·18	7·35	6·40	2·94	2·84	7·03	0·48	3·97	9·45	4·26	2·79	4·22	3·35	5·56	1·91	2·56
Long Pond ..	3·42	4·21	nil	1·36	1·80	7·29	3·00	5·18	4·96	4·10	2·29	4·38	1·44	1·44	3·26	0·88	3·47	3·27	3·63	1·88	4·94	4·78	4·23	1·69	3·64	2·77	1·07	1·62	5·68	3·21	2·16	2·26	5·65	3·12	1·47	3·56
Vale Royal ..	4·59	4·26	0·09	1·10	1·64	5·77	3·22	7·24	5·47	7·11	3·00	6·30	1·84	2·51	5·72	0·65	4·66	3·63	3·38	2·56	2·29	5·50	6·19	2·14	3·91	2·27	0·88	1·13	7·47	2·64	2·80	3·11	5·13	4·23	1·57	4·53
Means	3·84	2·92	0·08	0·84	2·45	8·16	3·01	6·63	6·90	5·97	2·17	4·84	1·43	1·40	4·84	1·27	5·00	3·51	4·27	2·92	4·24	6·32	6·11	1·87	2·57	4·97	1·07	2·63	8·55	3·10	2·10	2·98	5·20	4·72	1·26	3·58
70-Year Means ..	3·62	2·15	1·91	2·66	6·44	4·52	2·71	4·19	5·12	6·72	5·76	5·43	3·62	2·15	1·91	2·66	6·44	4·52	2·71	4·19	5·12	6·72	5·76	5·43	3·62	2·15	1·91	2·66	6·44	4·52	2·71	4·19	5·12	6·72	5·76	5·43
GROUP D:																																			
Richmond-Llandovery ..	2·04	2·79	0·98	3·46	4·01	1·92	1·96	2·75	10·08	8·48	3·39	10·84	2·88	4·28	6·93	0·54	6·45	1·77	1·57	1·45	0·46	6·39	10·30	5·65	4·99	4·05	0·28	2·01	2·84	2·76	0·70	1·64	2·89	2·94	3·20	7·54
70-Year Means ..	5·69	4·06	2·88	3·69	6·18	4·06	2·06	2·97	3·71	6·87	9·39	7·46	5·69	4·06	2·88	3·69	6·18	4·06	2·06	2·97	3·71	6·87	9·39	7·46	5·69	4·06	2·88	3·69	6·18	4·06	2·06	2·97	3·71	6·87	9·39	7·46
GROUP E:																																			
Gray's Inn C. ..	2·40	8·68	0·41	2·28	2·80	7·36	4·65	2·62	7·49	6·48	5·35	12·75	2·36	11·32	13·03	2·24	5·12	0·84	2·19	1·77	1·65	6·65	15·40	16·52	6·34	6·69	0·29	0·88	1·66	2·78	0·12	1·44	3·73	3·32	4·51	7·95
Means (1948–57) ..	4·76	6·82	3·04	2·84	5·62	3·75	3·52	2·65	4·82	6·83	8·78	10·05	4·76	6·82	3·04	2·84	5·62	3·75	3·52	2·65	4·82	6·83	8·78	10·05	4·76	6·82	3·04	2·84	5·62	3·75	3·52	2·65	4·82	6·83	8·78	10·05
GROUP F:																																			
Jam. Sug. Ests. ..	1·51	11·08	1·73	0·77	16·99	8·46	6·20	10·65	10·22	11·42	3·19	10·65	0·53	10·71	5·80	7·42	5·22	5·53	5·84	8·01	3·95	16·94	6·00	4·91	3·62	2·59	0·67	2·20	15·12	8·58	2·21	5·84	9·32	11·66	6·71	3·24
Serge Island ..	1·32	5·84	0·16	0·69	9·68	15·96	10·42	8·62	9·47	11·27	0·93	7·71	0·23	9·57	3·29	5·22	3·84	7·93	7·40	3·59	4·95	15·40	6·85	0·65	1·77	5·31	2·05	2·56	18·31	7·43	5·04	4·69	14·11	12·30	2·97	0·25
Means	1·42	8·46	0·95	0·73	13·34	12·21	8·31	9·64	9·84	11·34	2·06	9·18	0·38	10·14	4·55	6·32	4·53	6·73	6·62	5·80	4·45	16·17	6·43	2·78	2·69	3·95	1·36	2·38	16·72	8·01	3·63	5·27	11·71	11·98	4·84	1·74
Means (1948–57) ..	2·65	3·96	1·92	3·08	10·78	9·25	7·50	8·72	12·87	14·11	6·67	5·29	2·65	3·96	1·92	3·08	10·78	9·25	7·50	8·72	12·87	14·11	6·67	5·29	2·66	3·96	1·92	3·08	10·78	9·25	7·50	8·72	12·87	14·11	6·67	5·29
GROUP G:																																			
United Estates ..	0·85	6·74	1·11	2·49	6·51	9·24	8·16	6·28	6·16	6·77	3·95	3·77	0·74	1·04	3·42	4·93	7·94	8·67	8·21	6·83	5·26	12·35	3·14	1·56	2·87	1·64	2·41	4·37	7·47	2·76	6·93	5·00	8·06	5·96	2·10	2·02
Worthy Park ..	0·74	5·20	0·86	2·98	5·11	10·99	5·87	5·13	6·51	8·22	2·86	3·13	0·97	0·91	4·03	4·61	8·11	7·59	7·69	2·95	2·54	12·58	4·97	2·18	2·13	3·00	4·10	4·48	6·34	2·95	5·03	3·00	9·75	8·57	2·57	1·42
Means	0·79	5·97	0·98	2·74	5·81	10·12	7·02	5·71	6·33	7·49	3·41	3·45	0·86	0·97	3·72	4·77	8·02	8·13	7·95	4·89	3·90	12·47	4·06	1·87	2·50	2·32	3·26	4·42	6·91	2·86	5·93	4·00	8·91	7·27	2·34	1·72
70-Year Means ..	2·47	2·04	2·62	3·96	8·11	7·26	5·03	6·59	7·16	9·70	6·22	2·88	2·47	2·04	2·62	3·96	8·11	7·26	5·03	6·59	7·16	9·70	6·22	2·88	2·47	2·04	2·62	3·96	8·11	7·26	5·03	6·59	7·16	9·70	6·22	2·88

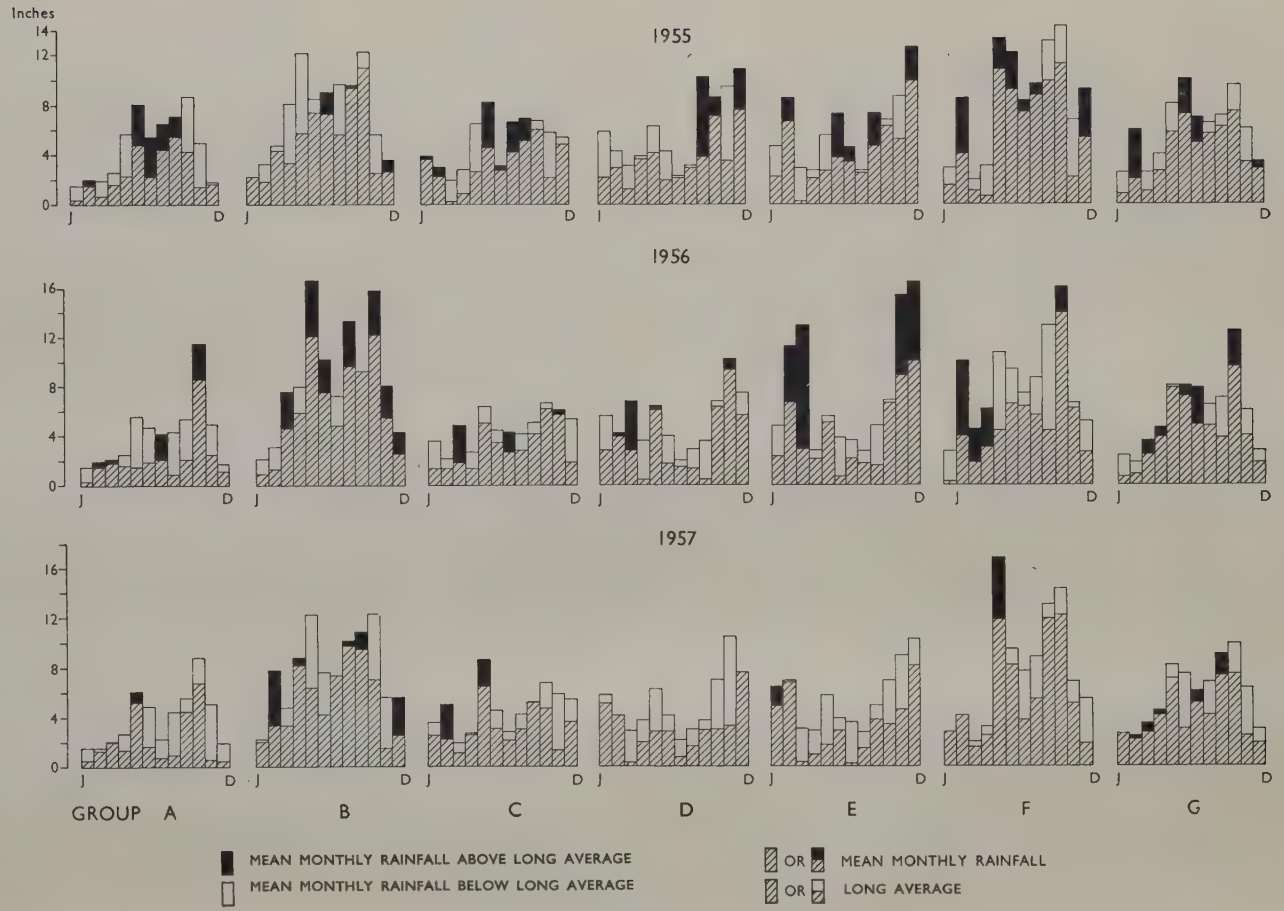


FIGURE 3
Mean Monthly Rainfall (Group A–G) 1955–1957) and Comparison with Long Averages

TABLE II

No. of Days in Each Month on which Average Precipitation Exceeded 0·5 Inches

	1955												1956												1957											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
GROUP A:																																				
Caymanas ..	–	1	–	1	–	5	1	5	4	2	1	1	–	1	1	2	–	1	2	–	–	6	1	–	–	–	1	3	2		–	–	2	3	1	–
Bernard Lodge	–	1	–	1	3	4	3	4	4	2	3	–	–	1	1	2	1	2	2	–	–	5	1	–	1	–	1	2	1	–	1	2	2	3	1	–
Innswood ..	–	2	–	1	1	3	4	4	7	3	–	1	–	2	1	2	4	–	3	–	3	7	2	1	–	1	2	1	2	–	2		3	4	–	–
Monymusk ..	–	2	–	–	1	9	3	3	2	2	1	1	–	2	2	1	–	1	2	–	1	3	1	–	–	–	–	–	4	3	1	–	2	3	–	–
New Yarmouth	–	–	1	1	–	9	2	3	1	4	1	2	–	1	1	–	1	2	2	–	1	3	1	–	–	1	–	–	5	2	–		2	4	–	–
Sevens ..	–	2	2	2	3	6	–	4	6	3	1	2					Not	recor	ded						–	–	1	–	3	2	–	–	2	4	–	–
GROUP B:																																				
Appleton ..	2	1	3	4	3	9	8	4	10	7	4	2	–	1	7	2	14	7	3	10	9	12	5	3	1	6	3	11	3	2	4	8	7	8	–	5
Holland ..	2	–	2	2	4	5	6	2	8	8	1	3	–	1	6	3	7	7	3	9	6	12	3	4	1	6	1	3	4	1	4	6	9	2	1	3
Frome ..	1	1	2	1	5	2	6	4	2	9	–	1	–	–	3	4	13	8	5	14	8	6	7	2	3	4	2	6	5	4	8	4	3	6	2	4
GROUP C:																																				
Barnett ..	1	–	–	–	3	6	2	10	6	6	2	2	1	–	4	–	4	3	4	2	2	1	4	–	–	2	2	3	9	3	2	2	6	2	–	3
Rose Hall ..	2	1	–	–	1	4	1	5	6	4	–	2	–	3	1	1	2	1	1	2	2	4	6	–	–	2	1	–	3	2	1	1	3	4	–	2
Hampden ..	3	1	–	–	4	5	3	3	6	4	1	4	–	–	5	2	5	1	2	3	4	3	5	2	2	1	–	2	6	4	3	3	1	4	1	2
Long Pond ..	10	2	–	1	–	5	2	2	3	3	2	4	–	1	3	–	2	3	1	–	3	3	1	1	3	1	1	1	3	3	1	1	4	1	1	2
Vale Royal ..	12	3	–	–	–	4	3	5	3	3	1	4	–	3	4	–	2	3	4	1	2	3	2	1	3	2	1	–	6	1	1	3	3	2	–	3
GROUP D:																																				
Richmond-Llandovery..	1	2	–	1	2	2	1	1	5	6	3	5	1	2	5	–	4	–	–	–	–	3	6	3	3	3	–	2	2	1	–	–	1	2	1	5
GROUP E:																																				
Gray's Inn C...	1	1	–	1	2	4	2	2	3	3	1	9	2	5	7	1	3	–	1	1	1	3	7	5	3	4	–	–	1	2	–	–	1	1	3	6
GROUP F:																																				
Jam. Sug. Ests.	2	4	–	–	6	6	4	6	8	8	2	7	–	5	3	4	3	4	5	3	1	7	4	3	1	2	–	1	6	5	1	4	4	7	5	1
Serge Island ..	1	4	–	–	4	8	7	5	5	7	–	5	–	4	3	2	3	4	5	1	5	9	6	–	–	1	1	–	7	4	4	3	5	5	1	–
GROUP G:																																				
United Estates	–	5	–	1	3	5	5	5	4	4	2	3	–	–	–	3	5	4	7	6	4	6	2	–	2	1	1	2	4	1	6	1	3	2	1	–
Worthy Park ..	–	4	–	2	3	6	4	4	5	5	3	1	–	–	3	3	7	6	5	2	2	6	3	–	1	1	2	2	4	2	2	2	5	7	1	–

D. IRRIGATION

Equipment

(i) *Overhead rainers.* The greatest advantage to be gained from the use of rotary sprinklers for irrigation rather than furrow distribution systems is in a saving of water. Under some irrigated estate conditions, the economics of the two methods are rather closely balanced, and if overhead irrigation is to be a practical proposition this advantage must be fully exploited. There is considerable scope for variation in the management of the overhead systems at present employed on estates, both in the sizes of the nozzles used and in the spacing of the rainer sites. An investigation on the problems involved was commenced during the year with the co-operation of the staff of Rose Hall Estates. The distribution from a single large rainer working under moderate wind conditions was examined—the moisture pattern found, being used to determine the composite patterns that would be obtained in practice with different rainer spacings. Irrigation engineers use Christensen's coefficient, Cu, to describe the uniformity of irrigation distribution. This index takes the value of 100 for perfect uniformity, whilst a value of 80 is accepted as a reasonable performance in moderate winds. For a square spacing of 160 ft., which corresponds to the most general practice in Jamaica, Cu was found to be 51 (the standard error of distribution being 45% of the mean), while for a square spacing of 120 ft., Cu was found to be 77 (the standard error of distribution being 30% of the mean). It is believed that an acceptable uniformity could be attained with a wider spacing than 120 ft. by changing the characteristic distribution profile of the rainer, and it is intended to carry out a series of tests using sets of nozzles of different relative sizes.

(ii) *Flexible pipe.* The considerable labour involved in the moving of portable lines in overhead irrigation systems, even with the quick-coupling aluminium pipes now in use, makes the prospect of light-weight, flexible tubing an attractive one. Polythene pipe is being produced commercially for this purpose and in the sizes available (up to 2 in. diameter) can be rolled on a mechanically driven drum. It is unlikely that irrigation rainers delivering less than 150 g.p.m. will be contemplated in sugar cane and unless various devices are used to equalize friction losses in lines of different lengths, pipes of 3 or 4 in. internal diameter are required. It is possible to make an estimate of the characteristics of such large diameter pipes, designed to work at a pressure of, say, 100 lb. per sq. in., from the physical properties of polythene:—

Internal diameter	Working pressure	Wall thickness	Cross section	Weight	Flexibility (i.e., maximum radius of curvature)
3 in.	100 lb./sq. in.	0·4 in.	4·2 sq. in.	1·7 lb./ft.	33 in.
4 in.	100 lb./sq. in.	0·5 in.	7·1 sq. in.	2·9 lb./ft.	43 in.

The weight per foot of pipe would appear to be excessive. The figures are calculated, however, using a safety factor of 4 (i.e., by assuming the bursting pressure to be 400 lb. per sq. in.) which is similar to that adopted in the specifications of smaller pipes. If this could be reduced the weight and cost would be reduced in proportion.

Polythene may also prove useful in the form of thin (about 0·004 in.) strips for lining irrigation canals to prevent seepage losses, and weed growth. It might prove cheaper than using concrete for the same purpose but if permanently operated would probably be subject to excessive wear and tear. Alternatively, it might be used in a thicker gauge in the form of a portable loose pipe, which could be laid along intervals of a suitable slope, to carry irrigation water under gravity. Take-offs would be provided in the form of "T"-joints, the outlets being tied when not in use.

Overhead v. surface irrigation

The 1st ratoon results from the overhead *v.* surface irrigation experiment at Caymanas—Cumberland Pen 24 and 25, tend to confirm those found in plants. Contrary to intention, it was not possible to apply water to all the overhead irrigated plots as frequently or as heavily as on the surface irrigated plots, that is, sufficiently frequently and heavily to ensure that at no time did soil moisture tension limit cane growth. This state of affairs existed during both the fall plant and 1st ratoon stages of the experiment and has necessitated a correction to some of the individual plot yields. The corrections have been obtained by extrapolation on a linear regression curve relating yield to soil moisture deficit. The corrections so made are likely to be overestimates, since the form of the true relation would not be linear but would be represented by a curve of decreased gradient at low moisture deficits. Thus the uncorrected and the corrected results give an estimate of the ranges in which the true values lie. It can be shown that within these ranges there can be no significant differences between the overhead and surface treatments. The results presented in Appendix II for this experiment are those which have been adjusted. Since there were no significant differences in juice quality in the fall plant results and since the 1st ratoon juice figures were not available for all plots, the results of cane yield only are discussed.

The interaction between variety and spacing of rows, under overhead irrigation, is shown in the following table. In the overhead irrigated plots (which received less water), B42231 gave a significantly better yield from a row spacing of 2·5 ft., compared with B4362 which did significantly better in a 5-ft. row spacing. Such a result is in line with what is known of the tillering and suckering habits of the two varieties, and

juice quality figures for fall plants show significant interactions in the opposite sense, there being no differences in the final analysis of sugar yield. There are no significant interactions in the surface irrigated plots.

TABLE III

CANE YIELD (TONS PER ACRE) UNDER OVERHEAD IRRIGATION FOR BOTH FALL PLANTS AND 1ST RATOONS

Spacing	Varieties	
	B42231	B4362
5 ft. row	98·2	125·4
2·5 ft. row	104·8	96·0
S.E. % g.m.	11·3	
Sig. Diff.	13·1	

Soil moisture deficit and irrigation

(i) *Monymusk.* The plant results of an irrigation experiment carried out in a salt land area at Monymusk (Salt Savannah—Cotton Walk 10) became available this year. The experiment is designed to test the effect of irrigation controlled at three predetermined deficits on the yields of B41227 and B4362 at three levels of nitrogen application. Differential irrigation was commenced at the age of four months and continued until the age of eleven months when the cane was dried out prior to reaping. Irrigation was applied at average maximum deficits of 1·2, 2·0 and 3·4 in., corresponding to irrigation cycles during complete drought of 10, 17 and 27 days. The results are presented in Table IV. Since there appears to have been no response to level of fertilizer application, only the results for irrigation and variety treatments are shown:—

yield should be obtained, a single row from each plot was reaped, weighed and sampled for a juice analysis, in October. Differential irrigation on nine of the fields was commenced in December, 1956 and continued into early September when heavy rain brought all plots to field capacity. Irrigation treatments on the five remaining fields were started in March and since results from these fields were not significant, they are not included in the following discussion.

The average mean deficits occurring in the four irrigation treatments were 0·9, 1·3, 1·3 and 1·5 in., a delay caused by a strike of irrigation workers during March having affected their spacing. Juice quality did not vary significantly and only the results of cane yield are presented in the following graph:—

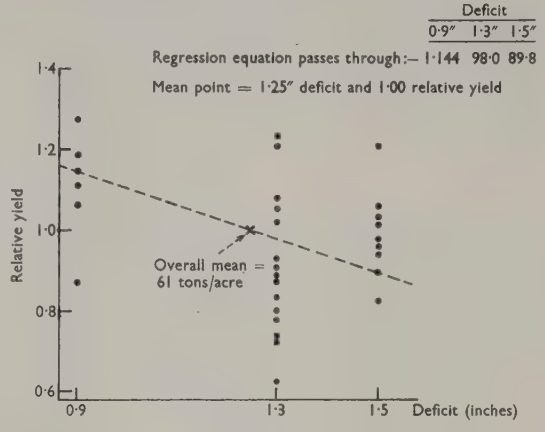


FIGURE 4

The yield from the most frequent treatment was greater than the mean yield from all other treatments

TABLE IV

PLANT RESULTS OF IRRIGATION EXPERIMENT AT MONYMUSK—SALT SAVANNAH—COTTON WALK 10

Tons Cane per Acre					% Available Sucrose					Tons Sugar per Acre				
Variety		Inches deficit			Variety		Inches deficit			Variety		Inches deficit		
B41227	B42231	1·2	2·0	3·4	B41227	B42231	1·2	2·0	3·4	B41227	B42231	1·2	2·0	3·4
33·2	31·5	34·1	33·8	29·0	10·3	9·9	10·2	9·9	10·2	3·4	3·1	3·5	3·4	3·0
S.E. % g.m. 12·3		14·2			10·7		13·1			12·6		12·5		
Sig. Diff. —		—			—		—			0·27		0·38		

Irrigation at a deficit of 2·0 in. increased cane yields by 16% and sugar yields by 14% compared with irrigation at a deficit of 3·4 in. Irrigation at a deficit of 1·2 in. produced no further significant increase.

(ii) *Innswood.* In July and August, 1956, fourteen dispersed replicates of four irrigation treatments were laid down with B41227 plant cane and were due to be reaped during 1957. Estate policy arising from strikes necessitated their being held over until the following crop, and in order that an estimate of the one year to the extent of 25% of the latter, a highly significant result. The corresponding average mean deficits of 0·9 and 1·4 in. correspond to irrigation cycles during complete drought of 14 and 24 days, respectively, the latter corresponding approximately to normal estate practice.

Rainfall analysis and irrigation

The soil moisture deficit concept is of particular value on estates where irrigation is usually regarded as

supplementary to natural rainfall. In such areas the need for irrigation varies so greatly from year to year that it is essential to study past rainfall records in relation to crop requirement in order to formulate a reliable irrigation policy. This is demonstrated in an analysis of rainfall records for a number of years on several farms at The West Indies Sugar Company, Frome Estate. Presented below are the soil moisture deficits which would have accumulated under fully transpiring unirrigated cane at the end of each month during the estate's critical period, firstly for the farm considered the wettest and secondly for the driest farm. The values as given are often hypothetical since the root zone of cane may only be capable of holding perhaps 2–3 in. of water. In the present context they are used to give a measure of the relative degree of drought, and also an indication of the number of occasions for each month in which irrigation of young ratoon was necessary immediately after reaping. A soil moisture deficit of 3 in. is taken as the critical value:—

TABLE V

Soil Moisture Deficits (Inches)

	Farm	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1948–49	Wettest	0	0	2·5	3·6	0	0
	Driest	0	0	3·1	2·9	0	0
1949–50	Wettest	0	0·5	1·3	3·0	4·8	2·2
	Driest	0	1·6	2·6	5·6	7·9	7·9
1950–51	Wettest	0	2·0	4·5	3·9	7·5	7·2
	Driest	0	1·9	4·5	6·7	9·9	11·1
1951–52	Wettest	0	0·5	2·5	4·3	6·4	7·3
	Driest	2·0	4·8	7·0	9·3	11·9	14·6
1952–53	Wettest	0·2	2·1	1·8	2·3	1·8	0
	Driest	1·3	3·8	2·5	4·3	5·3	6·1
1953–54	Wettest	0	0	2·1	2·0	0	0
	Driest	0	0	1·6	3·3	2·4	0
1954–55	Wettest	0·2	2·7	3·5	3·1	1·9	3·5
	Driest	0	1·4	2·4	4·0	5·7	6·0
1955–56	Wettest	2·6	2·6	4·3	6·0	4·1	0
	Driest	2·5	3·6	5·1	7·5	6·8	3·2
1956–57	Wettest	0	0	0	0	0	0
	Driest	0	0·3	0	0	0	0
Occasions	Wettest	0	0	3	6	4	3
	Driest	0	3	4	7	6	6

The problem of the subsequent irrigation of young cane is a more complex one requiring estimates of evaporation from a field with an incomplete leaf canopy, and the effect of changing depths of rooting, and discussion is at present confined to the nature of the factors involved.

Efficiency of different forms of surface irrigation

The normal system of surface irrigation consists of directing the water in canals laid out half-chain apart across the rows, and then leading the water into each furrow. The water therefore travels a distance of half a chain in each furrow. This method involves the cost of laying out and maintaining these half-chain apart canals. It was therefore considered desirable to determine whether a long line system might not be just as effective.

The investigation was carried out in heavy clay soil areas where it was believed that the loss of water due to downward percolation would be small. Some of the trials were designed to obtain a measure of the effectiveness of irrigating alternate furrows, as well as the merits of planting two rows on top of a large bank, 9–10 ft. wide. The experiments are being conducted at Innswood, Monymusk, Sevens and United Estates and the results of the cane yields obtained so far are summarized in Table VI.

Difficulties were experienced at the outset in getting the water to run the length of long lines, which ranged from 2·5 to 5 chains. This was due to the uneven surface of the land. However, after the irrigator had led the water to the end of the line, grading the furrows by his spade, the system was easy to practise in plants. The drawback appears to persist in ratoons, as the trash blanket which is unevenly distributed, presents a similar obstacle. This is reflected in the relative decline in yield from plant to 2nd ratoons in the Innswood trial. An appreciable saving of water is effected when every other row is irrigated or when two rows of cane are planted on a bank. Although there is no significant difference in yields between these

TABLE VI

CANE YIELDS RELATIVE TO STANDARD PRACTICE—100

	Innswood			Mony-musk	Sevens	United Estates	
	P	1st R	2nd R	P	P	P	1st R
Irrigating every row from 0·5 chain apart canals ..	56·1*	36·9*	33·4*	54·8*	47·6*	45·4*	52·2*
Irrigating every other furrow in long lines	104	98	90	90	98	—	—
Irrigating every furrow in long lines	—	—	—	96	108	—	—
10-ft. banks with 0·5 chain apart canals	101	91	91	97	110	94	90
S.E. % g.m.	5·6	5·1	12·4	8·0	14·5	10·5	7·9

* = Tons cane per acre

treatments and the standard, there is a tendency towards lower yields when water is run every 10 ft., and this perhaps affects the saving in water. When every row is irrigated in long lines, plant yields are similar to those obtained under the normal system.

The experiments are being continued, but it appears that unless fields are properly graded and the trash blanket in ratoons evenly distributed (which would be possible where cane is burnt) it is not recommended that the normal practice be altered. When these drawbacks are removed the position might be reconsidered.

E. NUTRITION

The use of fertilizers by sugar estates for the 1957 crop is summarized in Table VII:—

of the acreage now receiving this plant food at a rate equivalent to 1·5 cwt. per acre of muriate of potash (60% K_2O). In areas where potash has now been applied for about ten years, the application is becoming principally of a maintenance nature since leaf potash figures at five months of age are generally well above 1·4% K_2O in dry matter.

Nutrition investigations in the field

The work has shifted away from the conventional factorial fertilizer experiments, although some have remained in operation. More emphasis has been placed upon dispersing the component blocks of factorial experiments on to different fields. Table VIII gives a summary of the distribution of formal, dispersed block experiments and other nutrition trials, i.e., crop

TABLE VII

FERTILIZERS USED FOR EACH CANE CLASS

	NITROGEN				PHOSPHATE				POTASH			
	Acres fertilized	Tons N used	Mean lb. per acre	Acres fertilized % total acres reaped	Acres fertilized	Tons P_2O_5 used	Mean lb. per acre	Acres fertilized % total acres reaped	Acres fertilized	Tons K_2O used	Mean lb. per acre	Acres fertilized % total acres reaped
Fall plants	1,631	59	82	96	257	4	36	15	875	31	79	51
Spring plants	5,944	205	77	94	589	9	33	9	3,216	135	94	51
1st ratoons	9,539	340	80	99	664	8	28	7	5,686	229	90	59
2nd ratoons	11,891	441	83	99	845	11	28	7	6,099	240	88	51
3rd ratoons	10,930	389	80	99	1,303	17	29	12	6,190	241	87	56
Old canes	19,955	675	76	98	738	12	37	4	12,019	518	96	59
Totals	59,890	2,109	79	98	4,396	61	30	7	34,085	1,394	92	56

The nitrogen consumption per acre has remained roughly constant over recent years as also has the proportionate area receiving it. The plant cane area which received no dressings was principally old pasture land. The significance of phosphate increased appreciably at Worthy Park and United Estates and recent results now becoming available for Worthy Park confirm this change. The rendzina soils of the North Coast estates are also beginning to receive phosphate. The general demand for potash increased, with 58% log plots, micro plots and late nitrogen plots, maintained during 1957.

(a) Trace element investigations

Sugar estates in Jamaica do not apparently suffer seriously from trace element deficiencies. However, it was considered advisable to check this and trials were laid out at Caymanas, Frome and Vale Royal for this purpose. Magnesium, manganese, copper, boron, zinc and molybdenum are included in the treatments.

TABLE VIII

No. and Distribution of Formal, Dispersed Block and Other Nutrition Experiments in Operation—1957

	Fall Plants			Spring Plants		Ratoons				No. of fields with		
	Planted 1955	Planted 1956	Planted 1957	Planted 1956	Planted 1957	Reaped 1957						
	Reaped 1957	To be reaped 1958	To be reaped 1959	Reaped 1957	To be reaped 1958	1st	2nd	3rd	Total	Micro plots	Crop log plots	Late N plots
Northern Division:												
Barnett	–	–	–	2	–	4*	–	–	6	17	10	–
Hampden	–	–	–	–	–	–	–	–	–	–	–	–
Long Pond	–	–	–	–	–	1	–	–	1	17	–	–
Richmond/Llandovery	–	–	1	1	1	2*	1	–	6	25	10	–
Rose Hall	–	–	–	1	–	14	1*	–	16	16	10	–
Vale Royal	–	1	–	–	–	–	–	–	1	44	10	–
Central Division:												
Appleton	–	–	–	3	–	3*	1	1	8	42	3	–
Frome	–	–	–	–	3	–	2	–	5	153	8	56
Holland	–	–	–	–	1	–	–	–	1	22	3	–
Monymusk	–	–	–	–	3	–	–	–	3	105	20	–
New Yarmouth	–	–	–	–	–	–	–	–	–	27	–	–
Sevens	–	–	–	3	–	–	–	1	4	22	10	–
Eastern Division:												
Bernard Lodge	–	–	–	1	–	–	–	–	1	17	10	–
Caymanas	–	–	–	–	4	–	–	–	4	25	–	–
Gray's Inn Central	–	–	–	–	–	–	–	–	–	–	–	–
Innswood	–	–	–	–	1	–	–	–	1	16	–	–
Jamaica Sugar Estates	–	–	–	4* 1	1	–	–	–	6	45	–	–
Serge Island	–	–	–	–	–	–	–	1	1	15	10	–
United Estates	–	3	–	–	–	1*	–	–	4	49	10	–
Worthy Park	–	1	–	–	2	–	–	–	3	140	10	–
Totals	–	5	1	16	16	25	5	3	71	797	124	56

In the above table, the dispersed block experiments marked * (consisting of three blocks each) have been counted as one experiment

(*b*) *Merits of surface and sub-surface applications of fertilizer*

An experiment being conducted at Worthy Park indicated that sub-surface application of fertilizers gave substantial increases in yield in the plant and 1st ratoon crops.

(*c*) *Crop logging*

In last year's report reference was made to the great variation in rate of production of sugar per acre per month, even within areas receiving similar water supplies. During the year under review, 124 crop logging stations dispersed throughout the sugar cane areas, were operated. Two sets of paired plots were maintained at each station, one pair of plots receiving normal fertilizer treatment and the remaining pair receiving extra fertilizer either as 10–30 tons per acre of filter mud and 1·5 cwt. per acre of muriate of potash (60% K_2O), or as 3 cwt. per acre sulphate of ammonia, 1 cwt. per acre superphosphate (40% P_2O_5) and 1·5 cwt. per acre muriate of potash (60% K_2O).

The object was to check whether major element nutrition played a significant part in causing the variations in productivity shown to exist between fields. At the same time, it seemed desirable to obtain age-composition curves for typical, commercially fertilized fields and corresponding curves for cane receiving heavy extra dressings of nitrogen, phosphate and potash. Cane leaf and sheath tissue material was collected prior to 8.00 a.m. from each plot when the cane was 3, 4, 5, 7·5, 9, 10 and 12 months old in ratoon fields and the rate of stalk elongation in in. per day determined over each week immediately succeeding sampling. The sheath moisture content and total sugars % dried weight in sheaths were determined, whilst total nitrogen, phosphate, potash and magnesium were determined in the dried material of the leaf lamina. Rainfall and irrigation were recorded as well as cultural operations, and the yields of cane and juice quality. Although further work remains to be done, many of the salient conclusions now stand out.

The mean effects of treatments upon yields are given in Tables IX and IXA.

The data show that the responses likely to be obtained, on the average, in irrigated and areas of heavy natural rainfall are small, and are unlikely to be economic. This does not mean that relatively small areas may not exist where economic gains can be obtained, but simply that on the whole, the current fertilizer policy is not very far wrong.

TABLE IX

THE INFLUENCE OF EXTRA FERTILIZER TREATMENTS ACCORDING TO THE MAIN GROUPS OF SIMILAR WATER SUPPLY

WATER SUPPLY GROUPS	TONS CANE PER ACRE			TONS CANE PER TON SUGAR			TONS SUGAR PER ACRE		
	Normal	Extra	% increase	Normal	Extra	% increase	Normal	Extra	% increase
Irrigated areas	39·6	42·1	6	8·2	8·3	1	4·8	5·0	4
High rainfall areas	39·5	43·4	10	7·2	7·6	6	5·5	5·7	4
Medium rainfall areas.. ..	37·7	42·7	13	7·5	7·9	5	5·0	5·5	10
Dry, unirrigated areas ..	25·0	28·2	13	8·2	8·0	−3	3·1	3·6	16
Miscellaneous areas	27·5	31·2	13	7·6	7·9	4	3·7	4·0	8

TABLE IXa

THE INFLUENCE OF EXTRA FERTILIZER TREATMENTS ACCORDING TO THE LEVEL OF PRODUCTIVITY OF NORMALLY FERTILIZED FIELDS

Productivity level of normally fertilized fields	TONS CANE PER ACRE			TONS CANE PER TON SUGAR			TONS SUGAR PER ACRE		
	Normal	Extra	% increase	Normal	Extra	% increase	Normal	Extra	% increase
<30 tons cane per acre ..	25·1	28·5	14	7·8	7·9	1	3·2	3·7	14
30–45 " " ..	37·2	40·5	9	7·8	8·1	4	4·9	5·0	2
>45 " " ..	55·4	58·6	6	8·8	8·8	0	6·4	6·7	5

In areas of medium rainfall, such as for example, Worthy Park and United Estates, the margins to be gained are definitely higher, and are probably economic, whilst in the dry areas the current fertilizer policy is probably capable of being further increased with resultant worthwhile gains, and in these areas, the increased levels of fertilizer would not appear to affect juice quality adversely. The general conclusions are in agreement with Table IX since in the survey, cane yields are related *inter alia*, to availability of water.

Mean rate of growth curves are given in Figure 5 and their corresponding mean accumulation growth curves in Figure 6.

Under natural rainfall, rate of growth falls approximately linearly with age, whilst under irrigated conditions, it increases to a maximum at 4–5 months and then falls approximately linearly with age. Under conditions of irrigation and high natural rainfall mean maximum growth rate lies between 0·6 and 0·7 in. per day. *It seems important to ascertain why early growth rate is greater under high natural rainfall conditions than under irrigation.* In many instances it may well be caused by inadequate early watering; the low early rates in dry, natural rainfall estates are due to this. The late "hump" in the rate of growth curves for medium rainfall estates closely reflects the consequences of summer drought and the beneficial effects of autumn rains. Adequate plant food during this period is stressed.

Growth rate is most significantly (> 1000: 1) correlated individually with sheath moisture, leaf nitrogen, phosphate and potash and a multiple regression between rate of growth, plant composition and age is possible. In all cases, age plays an overriding part in determining levels of growth and plant composition and has to be taken into account carefully when interpreting plant composition.

Although the early months are of vital importance (since these constitute the period of greatest rate of

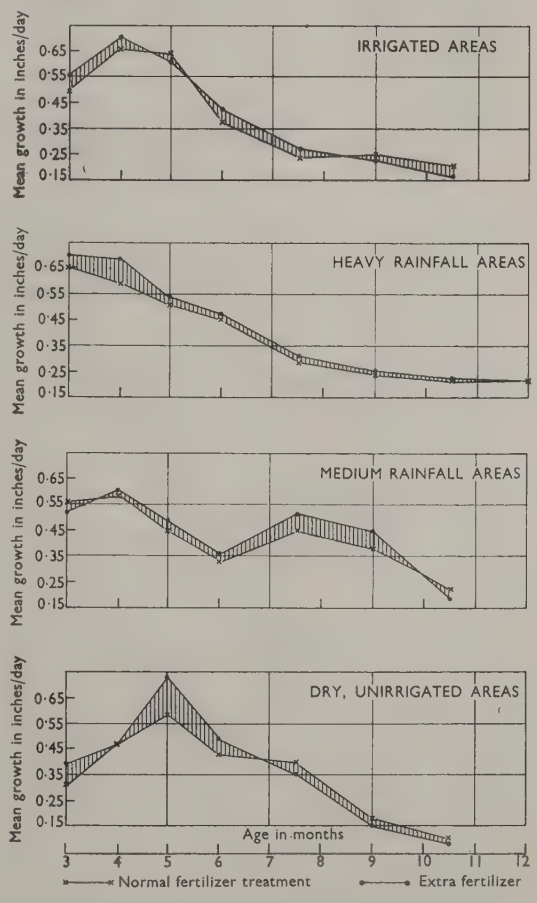


FIGURE 5. Mean rate of elongation

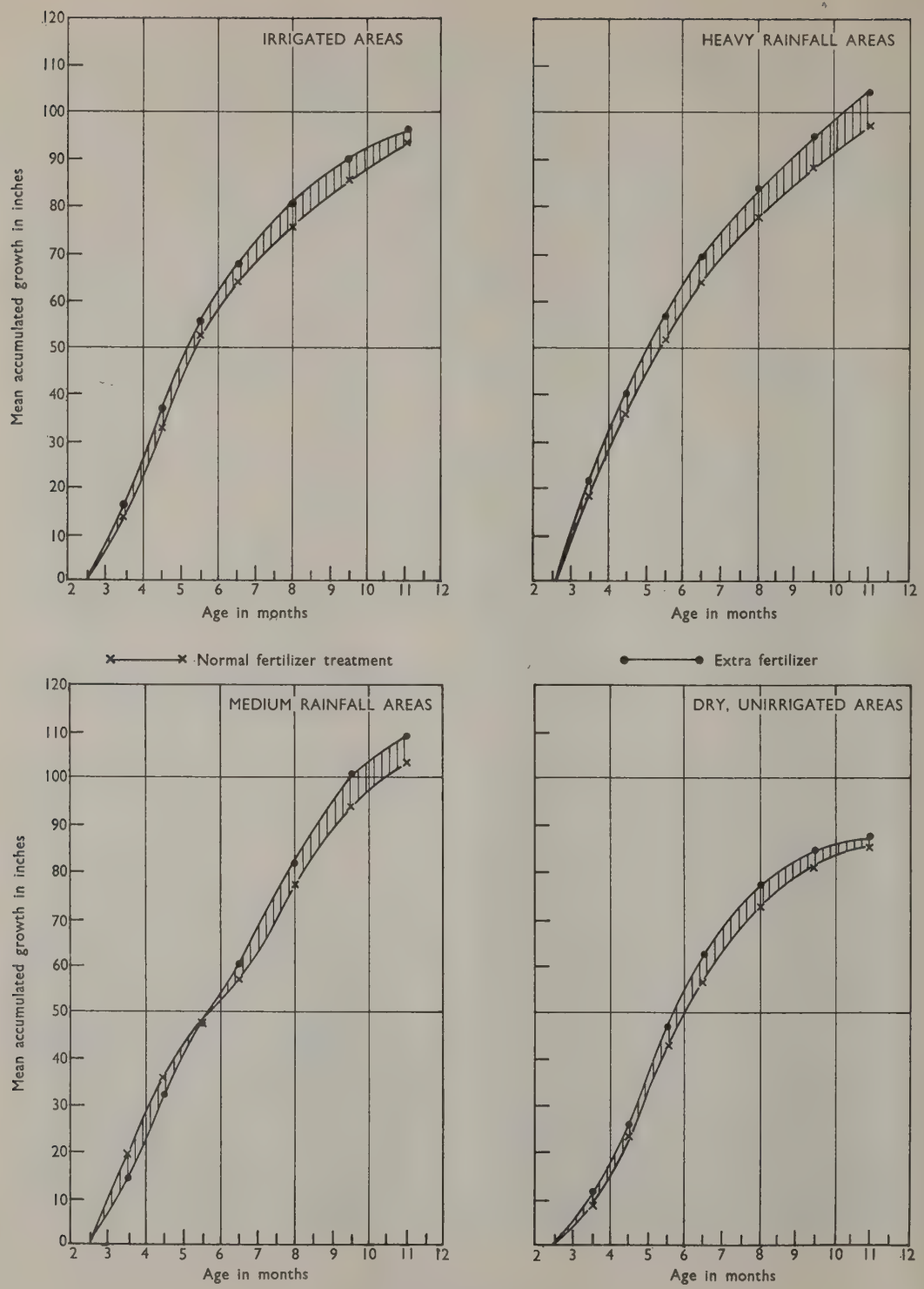


FIGURE 6
Mean accumulated elongation

elongation) it seems also important to pay particular attention to the period between 6 and 9 months, for relatively high rates of growth are possible at this period in some areas compared with others. For example, on high rainfall estates the mean rate of growth at this time was 0·4 in. per day against only 0·29 in. on irrigated estates, a difference of 39%. These differences are largely due to the relatively adequate distribution of water during the summer and early autumn months in the case of heavy rainfall estates compared with the inability of surface irrigation to meet the strain under the dry conditions at similar times. A combination of April and May rains with a reduced irrigation demand during crop makes it possible to attain growth rates similar to high rainfall estates between 4 and 6 months age. In certain instances, a temporary insufficiency of nitrogen may also play a part at the 6–9 month period.

Figure 7 illustrates sheath moisture-age values according to the level of productivity of normally

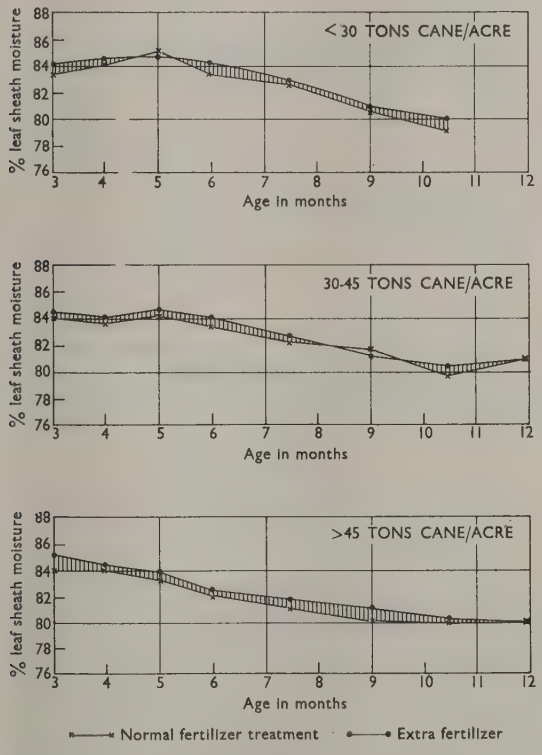


FIGURE 7

Leaf sheath moisture according to age and level of productivity of normally fertilized fields

fertilized fields. The frequency with which a sheath moisture of 88% is obtained, is small. The highest yielding cane is associated with a mean sheath moisture of 85% at 3 months, falling steadily to a level of nearly 80% at 12 months age. Even at 80% sheath moisture, excellent juices are possible. The sheath moisture-age curve is very different for annual cane compared with long term cane grown in Hawaii. Sheath moisture at harvest is in the high seventies or near eighties and it would seem completely impracticable to reduce their values to the figure of 73% quoted in Hawaii.

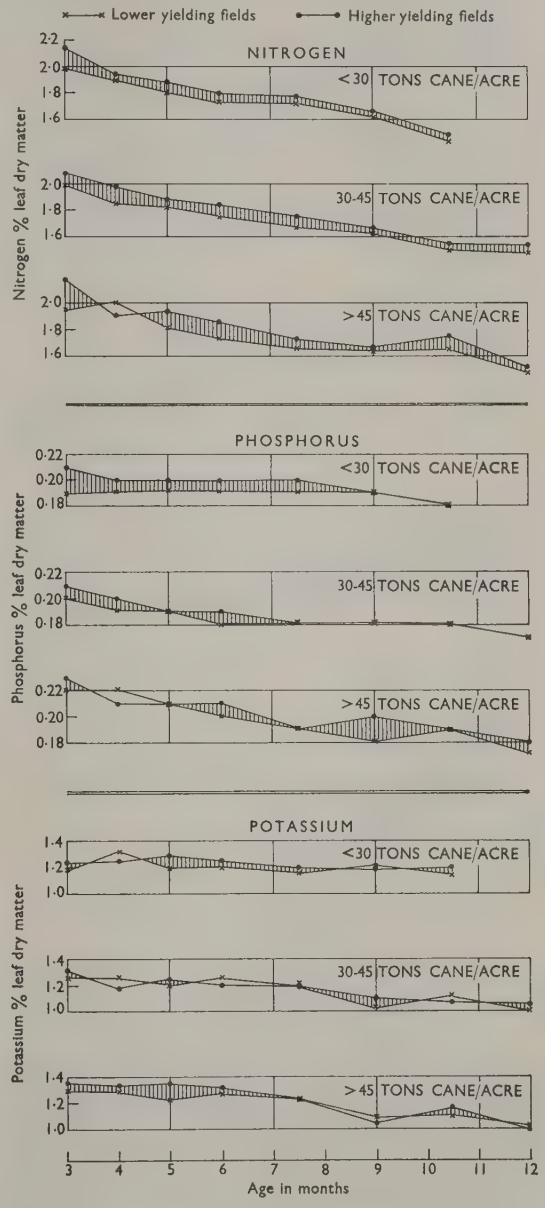


FIGURE 8

Leaf nitrogen, phosphorus and potassium composition according to age and level of productivity of normally fertilized fields

The study of age-composition curves with respect to level of production are interesting and instructive (see Figure 8, p. 15). Heavy nutrient applications produced their greatest effects in leaf nitrogen, followed by leaf phosphate with leaf potash showing the least effect; but in all, the degree of variability between

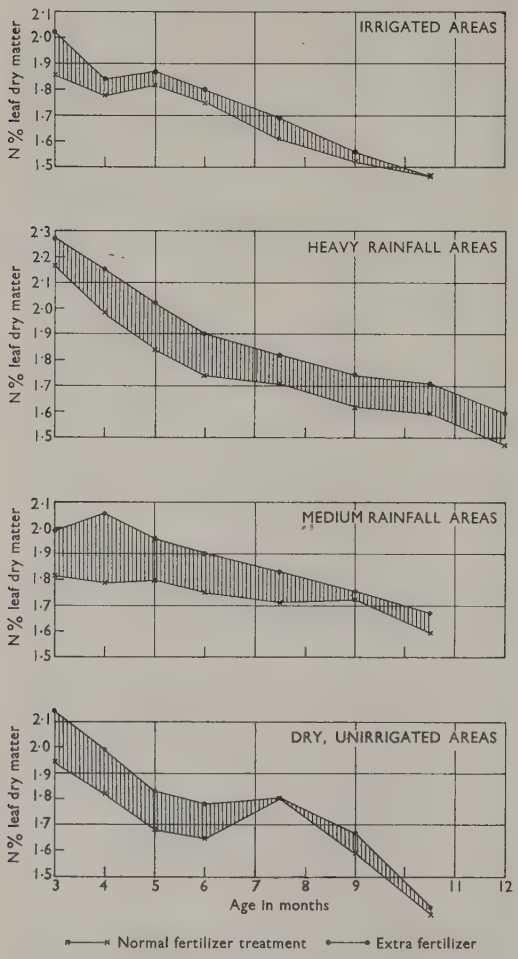


FIGURE 9

Leaf nitrogen composition according to age

fields in each production level group or each ecological group was high.

The optimum nitrogen % leaf dry matter probably falls from about 2·2 at 3 months through 1·9 at 5 months to 1·75 at 7 months, which is somewhat higher than figures previously used, e.g., 1·8 at 5 months, and appreciably higher than values quoted by British Guiana workers.

The highest yielding fields produced little or no response in leaf phosphate to increased phosphate dressings and had phosphate leaf dry matter contents of 0·46–0·50% at 3 months, falling through 0·44–0·48% at 5 months to 0·42–0·45% at 7 months—figures in close agreement with levels deduced from field experiments previously. The leaf response was greatest in the lower yielding category, which of course includes areas where soil moisture is known to have been limiting. Under such circumstances, phosphate uptake may have been limited by inadequate soil moisture.

A leaf potash level of 1·55 at 3 months falling through 1·48 at 5 months to 1·45 at 7 months appears adequate.

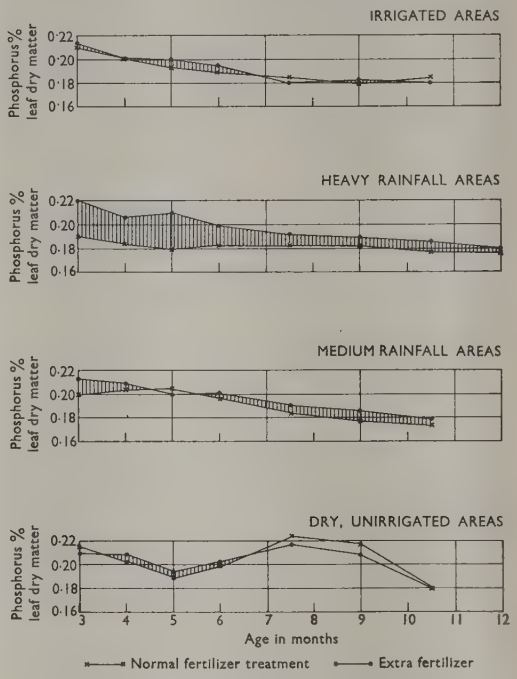


FIGURE 10

Leaf phosphorus composition according to age

These figures are somewhat higher than the levels previously established. Cane in which potash uptake was particularly low, relatively, was frequently characterized by abnormally low leaf concentrations at 3 and 4 months. It would seem that special attention needs to be given to uptake at this age. The lower limits of uptake at different ages revealed in the data are very interesting, particularly as many of these were obtained after applications of at least 1·5 cwt. per acre of muriate of potash. The particularly high calcium saturation of many sugar cane soils is suspected as playing a part in many instances in keeping down potassium leaf dry matter concentration, even in the presence of potash dressings.

Age-composition curves are given in Figs. 9, 10 and 11.

The nitrogen % dry matter under irrigated conditions, responds least to extra nitrogen, particularly below 5 months age, and like sheath moisture, suggests that the early management of cane during irrigated ratoons requires investigation. The response to phosphate is of little importance but potash may be limiting

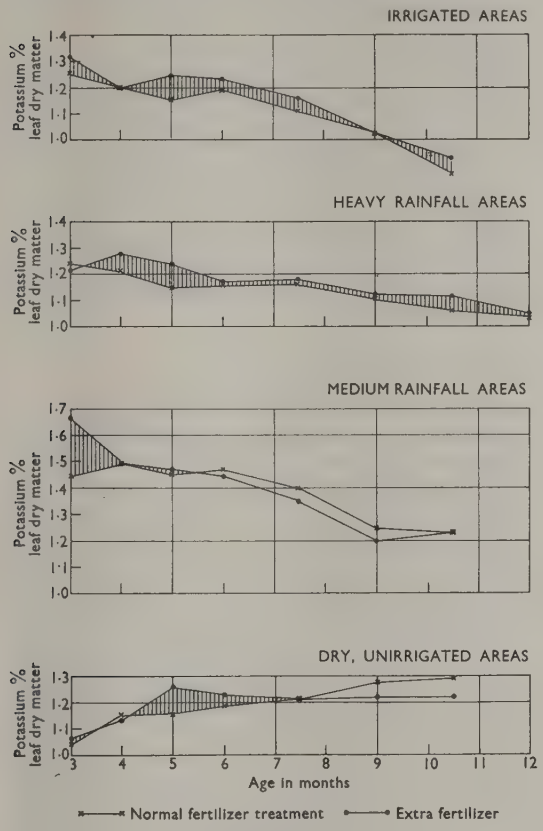


FIGURE 11
Leaf potassium composition according to age

growth in some areas. Compared with other ecological areas and particularly when the mean composition of the leaf dry material is taken into account, the responses in yield and in chemical analysis of leaves, to applications of extra fertilizer on irrigated cane are disappointing.

Under conditions of heavy rainfall, responses in leaf nitrogen and phosphate have been appreciable, the former having values much above optimum. In these areas, responses were probably due to an increased uptake of phosphate and potash, the latter especially between 3 and 6 months.

On medium rainfall estates it would appear that extra nitrogen is required but that the quantities applied in this investigation (an extra 3 cwt. per acre sulphate of ammonia) were too great. The response to extra potash is not important, neither is it to phosphate, except in the case of a few fields.

In the dry, unirrigated areas, the greatest response remains to be obtained by increasing nitrogen.

Where nitrogen uptake was excessive, for example, in wet areas and in medium rainfall areas, the effects of extra fertilizer upon juice quality were adverse to the extent of increasing tons cane per ton sugar by 5 to 6%. In such areas, leaf nitrogen at 12 months of age was 1·6% in dry matter, compared with a value of less than 1·4% elsewhere.

Total sugars in sheath dry matter remain at low values in heavy yielding fields from 3 months of age onwards, i.e., between 6 and 7·5% dry matter, until the cane is 9 months old, after which sheath sugars increase rapidly but only exceed the critical figure of 10% in Hawaii at 11 months age. Low sheath sugars during period of growth are associated with high productivity—Figure 12:—

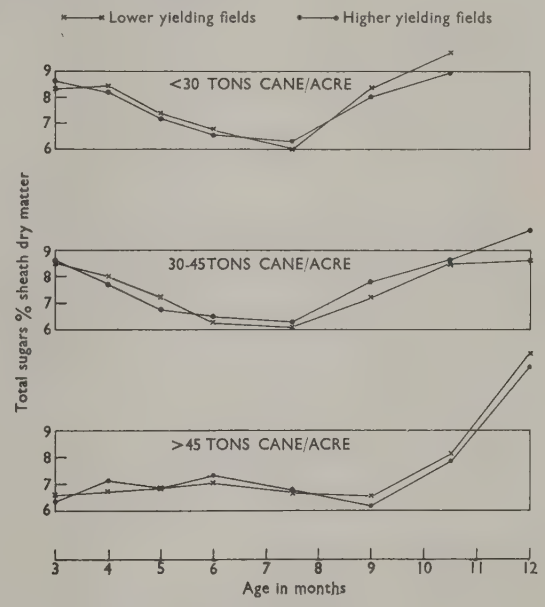


FIGURE 12
Total sugars % sheath dry matter according to age

An analysis of the results of this survey shows that yields can be increased in some areas by greater control of nutrition, but nutrition is not the answer to the very great variation which exists from field to field within areas of similar available water supplies. The crop logging of cane on irrigated estates strongly suggests that under these conditions, cane growth is not being fully developed and that much improvement might be brought about by studying and applying the results of logging on a larger number of fields.

(d) Sulphate of ammonia and urea as sources of nitrogen supply

Recently, interest in urea has been aroused because

of its rather comparable price per unit of nitrogen and reduced storage and transport charges. Furthermore, if aerial fertilizer dressings proved economic, the case for urea would be strengthened. Twelve experiments were laid out to compare the two sources of nitrogen and the results of the 1957 crop are summarized in Table X:—

TABLE X

Relative Sugar Yields of Sulphate of Ammonia and Urea Compared with No Fertilizer

Experiment sites	Response to	
	Sulphate of Ammonia	Urea
Appleton	121	118
"	115	114
"	112	101
"	107	105
"	93	103
Barnett	103	110
"	97	98
Bernard Lodge	122	108
Jamaica Sugar Estates	132	116
Monymusk	98	94
Richmond-Llandovery	135	134
Sevens	147	143
Average	115	112

It will be observed that in nine experiments, sulphate of ammonia plots outyielded the urea plots, but in only three of these were the differences significant. Overall, the response to sulphate of ammonia was 15·2% and to urea 12%, and assuming that a measure of their relative efficacy can be taken as the comparison of their responses, urea is about 80% as effective as sulphate of ammonia, under the conditions of the experiment. However, due to the variable nature of the responses obtained it is doubtful whether any real case can be made out in favour of the relatively greater value of sulphate of ammonia. Further work has been started to estimate the effects of the biuret content of urea on cane.

(*e*) *Late nitrogen applications*

The excellent results obtained from late nitrogen applications at Richmond-Llandovery applied through the overhead irrigation system, encouraged the laying out of trials on other estates to determine whether this treatment was economic or not. Plots were given an extra dressing of 2 cwt. per acre sulphate of ammonia on 56 fields dispersed over Frome. This was applied when the cane was between 4·5 and 7 months of age, and most of the plots received their late dressing when the cane was about 5·5 months old. The results are summarized in Table XI.

Appreciable responses in cane yield to late nitrogen applications were obtained on every section of Frome, and although this treatment tended to depress juice quality, it resulted in increased sugar yields. Overall, there was an increase of more than 3 tons of cane per acre and nearly a third of a ton of sugar per acre due to late application of 2 cwt. per acre sulphate of ammonia.

Similar experiments were laid out at Appleton on two fields, but the benefits from late nitrogen applications there were small, amounting to 4% increase in cane and 1% increase in sugar.

(*f*) *Routine nutrition control*

When the level of nutrition in cane is levelling off upwards, the further determination of advice in regard to plant food becomes difficult since the differences to be measured decrease with respect to experimental error. The opportunity was taken to examine a new approach whereby leaf analysis of cane on small plots treated with extra fertilizers and on the adjacent area of normally treated fields, were compared. The method appeared to have merit in that although the total number of fields leaf analysed might be only slightly less than otherwise, the number of sites on which cane responses to extra supplies of plant food was measured could be greatly increased over previous experience. In all, plots were laid out on nearly 800 fields. In the majority of cases, four plots to each field were used, the treatments were Control, NP, NK and PK, the extra levels of fertilizer being 3 cwt. sulphate of ammonia, 1 cwt. triple superphosphate and 1 cwt. muriate of potash (60% K_2O) per acre. In a few cases phosphate was applied together with filter mud—the latter as a source of extra nitrogen, whilst in others, two plots only were used per field—complete fertilizer *v.* control. Leaves were sampled for analysis and size

TABLE XI

Tons Cane per Acre, Tons Cane per Ton Sugar and Tons Sugar per Acre for Control and Late Nitrogen Plots

Section	No. of trials	(A) Control			(B) Late N plots			Difference (B Minus A)			
		TC/A	TC/TS	TS/A	TC/A	TC/TS	TS/A	TC/A	Sig. Diff.	TS/A	Sig. Diff.
Masemure	12	40·8	7·32	5·62	46·7	7·82	6·14	5·9	2·4	0·52	0·41
Mint	11	40·7	7·29	5·58	43·2	7·35	5·97	2·5	—	0·39	—
Belle Isle	14	43·0	7·07	6·11	46·1	7·17	6·45	3·1	1·5	0·34	0·26
Shrewsbury ..	12	38·6	7·15	5·44	41·0	7·55	5·49	2·4	2·1	0·05	—
Frome	7	41·9	7·39	5·66	44·3	7·52	5·94	2·4	2·3	0·28	—
Average ..	56	41·0	7·22	5·70	44·4	7·47	6·02	3·4	—	0·32	—

determinations at 5 and 7 months. Fertilizer advice based upon a combination of comparisons between treatment, leaf composition and leaf size, will be attempted. In addition, the plots on 150 to 200 fields will be reaped and weighed as a general check. Where leaf analysis is concerned, the method should be capable of detecting the level of nutrition at a time when it is suspected that temporary nutrient shortages occur in some areas. Furthermore, by relating leaf composition to treatment in each case, the complicating effects of weather immediately preceding sampling are less likely to be misleading when interpreting leaf composition. Most of the analytical work has been completed so that it should prove possible to issue advice early during the coming crop and in time to keep pace with reaping.

F. CULTURAL AND MISCELLANEOUS STUDIES

The number of field experiments operated pertaining to cultural and miscellaneous studies is given in Table XII:—

TABLE XII

No. and Distribution of Cultivation and Miscellaneous Trials in Operation During 1957

	Fall Plants			Spring Plants		Ratoons			
	Planted 1955	Planted 1956	Planted 1957	Planted 1956	Planted 1957	Reaped 1957			
	Reaped 1957	To be reaped 1958	To be reaped 1959	Reaped 1957	To be reaped 1958	1st	2nd	3rd	Total
Northern Division:									
Barnett	–	–	–	–	–	–	–	–	–
Hampden	1	–	–	–	–	–	–	–	1
Long Pond	–	1	–	–	–	–	1	–	2
Richmond/Llandovery	–	–	–	–	–	–	1	–	1
Rose Hall	–	–	–	–	–	–	–	–	–
Vale Royal	–	–	–	–	–	–	1	–	1
Central Division:									
Appleton	–	–	–	–	–	2	4	1	7
Frome	–	–	–	17	16	4	6	4	47
Holland	–	–	–	–	–	–	–	–	–
Monymusk	1	–	–	–	–	–	–	–	1
New Yarmouth	–	–	–	–	–	–	–	–	–
Sevens	–	–	–	1	–	–	–	–	1
Eastern Division:									
Bernard Lodge	–	–	–	–	–	–	–	–	–
Caymanas	–	–	–	–	–	1	–	1	2
Gray's Inn Central	–	–	–	–	–	–	–	–	–
Innswood	–	–	–	–	–	1	1	–	2
Jamaica Sugar Estates	–	–	–	–	–	2	1	–	3
Serge Island	–	–	–	–	–	–	2	–	2
United Estates	–	–	–	–	–	2	–	–	2
Worthy Park	–	–	–	–	–	1	1	–	2
Totals	2	1	–	18	16	12	18	6	74

The merits of deep tillage

The sub-surface of much of the heavy clay soils in the Jamaica sugar industry is still fairly moist when land is being prepared for replanting. Under these conditions the value of knifing or ripping may not be as great as is generally believed, and experiments are being conducted at Appleton, Frome and Worthy Park to assess this. In two experiments out of four the results indicate substantial benefits from the deep cultivation, but in the other two trials no such effect was noted. When deep tillage resulted in benefits, ripping appeared to be slightly more effective than

Effects of trash turning and inter-row cultivation

Work in the past strongly indicated that no benefits are derived from turning trash under dry conditions for the present commercial varieties. Under conditions of heavy rainfall, however, this measure should be adopted to prevent a waterlogged condition. Inter-row cultivation did not produce any response, except in cases where fields were damaged by heavy equipment during reaping in wet weather. These trials were conducted for two ratoon crops only, and it may be that some form of ratoon cultivation would prove beneficial after that period, particularly under heavy clay soil conditions.

knifing in the plant crop. This is confirmed in two other experiments, but in the 1st ratoon crop the differences appear to be smaller. Little or no gain is obtained from cross knifing or cross ripping.

Cultivation and soil structure—liming

The beneficial effect of liming material when knifed into heavy clay soils was demonstrated last year, and the effect has now been confirmed in 1st ratoons. Investigations have been increased in number and applications at the rate of 6 tons per acre of gypsum have been made on ten dispersed plots at Sevens Estate and five at Innswood.

The effects of infield structural transport vehicles upon cane yield

A number of plant cane fields at Frome have been reaped as uniformity trials in such a way that it will ultimately be possible to measure the effects of infield transport upon cane yields and ratooning. The first measured differences will accrue from the reaping this year. The investigations are designed to relate the effects to the number of vehicle passes, the total weight of cane and the nature of the transport, track tractor drawn carts and ox-drawn carts. Soil moisture values at times of carting are being recorded so that any detrimental effects may be related to soil physical characteristics later, for example, the plasticity limits of the soil. Without the co-operation of the Frome staff, much of this work would not be possible.

An attempt was made, following the reaping of one such field under wet conditions to measure the degree of soil compaction resulting from the passage of transport vehicles. Soil cores each 350 c.c. in volume were extracted using a Bradfield type sampler, and the dry bulk density determined. Samples were taken in duplicate at four depths at different sites in the uncompacted areas and in the areas where loading equipment had passed frequently. The comparison showed that the compaction, expressed as a fractional decrease in pore space, was of the order of 10% in the top 3 in. of soil, and there was a further indication that the effect extended down to a depth of 8 in. Results of measurements with a soil penetrometer showed that 50% more energy was required to penetrate the upper 8-in. layer in the compacted areas. It was not found possible to determine with a single set of measurements the degree or extent of the compaction caused by a single pass of a tractor or loaded cane cart. An analysis of the variance of the measurements made in the undisturbed plots is of interest in indicating the nature of the soil heterogeneity at different depths within the field.

S.E. expressed as a % of total pore space	Depths			
	0–3 in.	5–8 in.	10–13 in.	15–18 in.
Within pits	2·8	6·0	5·3	3·4
Between pits ..	4·4	11·0	11·7	10·1

Down to a depth of 8 in. the large scale heterogeneity within the field is not significantly greater than the heterogeneity within a single pit, and in the surface 3 in. the soil is very uniform indeed. At depths between 5 in. and 18 in. the overall heterogeneities appear to be similar and from 10 to 18 in. are significantly greater than the variability within a pit at the corresponding depth.

For the plant crop the weights of each plot were recorded in order to correct for heterogeneity in the fields. These weights have afforded the opportunity of determining the variability of yield potential in different areas of a field. The plots consisted of three beds by one chain, and were compared to assess the variation between contiguous sets of three beds, and the variation along the beds varied from field to field, the range being from 0·2 to 6·6 tons cane per acre. The average variation was of the order of 5% of the mean yield.

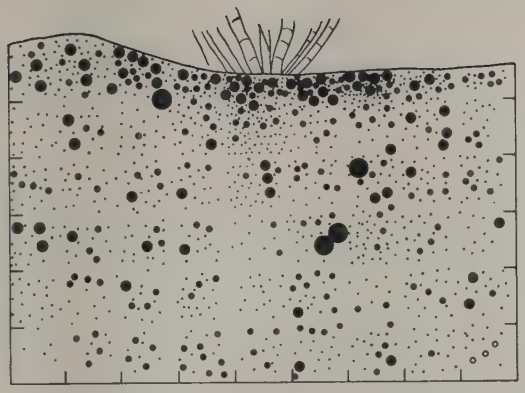
Cane tonnages along the beds show a most interesting trend, and the greatest yields were obtained nearest the interval to which all the cane was drawn. This means that greater tonnages were recorded on areas which had the greatest quantities of cane drawn over them *before* replanting. The productivity became progressively smaller at longer distances along the bed from the interval. The average figures for the 16 fields being examined are:—

Distance from interval	Tons cane per acre
4 chains	42·1
3 "	42·9
2 "	44·4
1 "	46·7
S.E. % g.m.	6·0

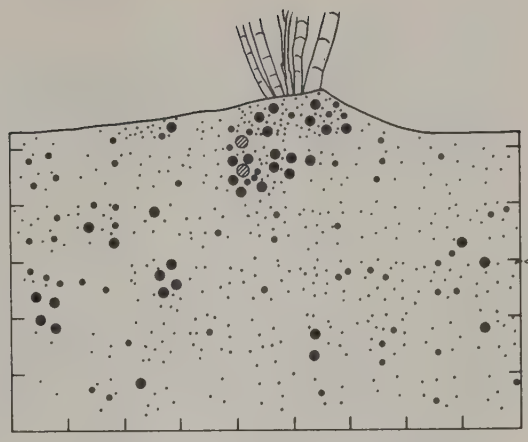
A possible explanation for the fertility trend would be the erosion of the bed surface soil into the drains with its subsequent transport by moving drainage water to one end of the drains, from which it is spread back on to the nearest part of the bed.

Root distribution studies

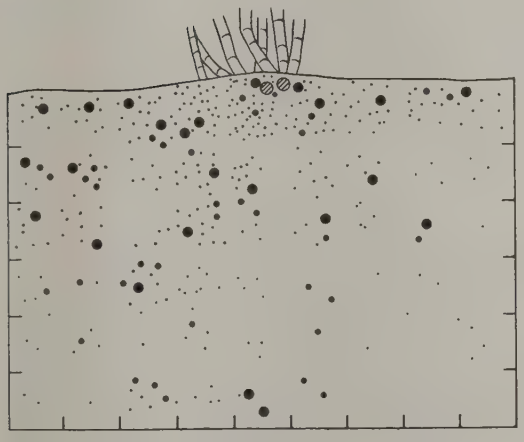
Poor soil physical conditions constitute the limiting factor on sugar production in perhaps many areas of Jamaican estates. The nature and intensity of such conditions can be expected to manifest themselves in the shape and intensity of the rooting system of the cane plant as a whole, as well as in the characteristics of individual roots. A survey of the rooting habits of sugar cane as they exist at present will be of value in determining the extent and type of soil structural problems likely to reward detailed study. Work was commenced during the autumn with the examination of root pits at Caymanas and Innswood Estates. The light alluvial soils of the former and the heavy clays of the latter could be expected to show marked differences in their effect on root structure, and these are illustrated in Figure 13—A, B, C and D. Each root system is depicted by means of a dot diagram representing the intersections of roots of different sizes with a vertical plane cut across the cane row and through the cane stool. Typical individual roots are also studied in detail, soil samples taken, and descriptions of the physical condition of the soil made. It is



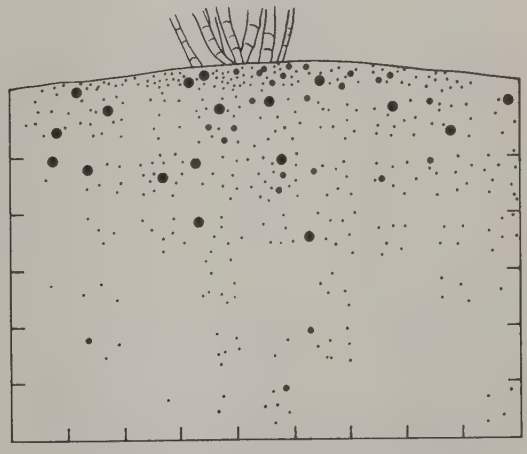
(*a*) A light river-alluvium at Caymanas



(*b*) A moderately well-structured river-alluvial clay at Caymanas



(*c*) A heavy calcareous clay soil at Innswood



(*d*) A heavy manure clay soil at Innswood

⊘ = Original cane sett

Scale

└──┘ = 6 inches

Root diameter (inches)

● = > 3/32″

● = 3/32″ — 1/16″

• = 1/16″ — 1/32″

· = < 1/32″

FIGURE 13

intended to develop and extend this work in the coming year.

Standover cane

It is a well known phenomenon that cane undergoes a definite ripening stimulus during the winter months. Under irrigated conditions this can be counteracted by irrigation and fertilizer applications, but under natural rainfall conditions, it is not easy to see how the situation can be met if two-year cane is to be grown. In order to determine the differences to be expected if cane is allowed to stand over against cane reaped annually under natural rainfall conditions, plots were laid out at Appleton, Frome and Vale Royal on the main commercial varieties. The standover plots were differentially treated with sulphate of ammonia when they were 11 months old. Unfortunately, the plots at Vale Royal were destroyed by fire, and no results were obtained from them. A summary of the Appleton and Frome results is presented in Table XIII.

TABLE XIV

CANE QUALITY RELATIVE TO ANNUAL CANE AVERAGED OVER TWO YEARS = 100

Variety	Annual cane (TC/TS)	Two Year Crop		
		Cwt/acre Sulphate of Ammonia		
		0	0·75	1·50
B41227 ..	7·68	105	99	102
B4362 ..	6·61	101	102	100

be effected is a survey, and this was carried out for all agricultural operations on Frome, Innswood, Monymusk, Vale Royal and Worthy Park. The findings for plant cane operations are summarized as follows:—

(*a*) An estimate of the number of tractor hours that would be saved if trash were burnt prior to replanting: Frome, 4,400; Innswood, 850; Monymusk, 7,000 and Vale Royal, 240.

(*b*) Innswood should consider investigating the relative merits of knifing and gyrotilling, as knifing can be carried out at about five times the speed of gyrotilling.

(*c*) It might be possible for Monymusk to dispense with one of their knifing or ripping operations without detriment to their yield.

(*d*) Frome, Monymusk and Vale Royal consume less tractor hours in land preparation than Innswood and Worthy Park. The first three named estates perform their tractor operations on a task basis, and the last two on a day basis.

(*e*) Frome's manpower requirements for making and maintaining drains are very high. It is suggested that the solution to this problem may be either a modification of the present cultivation system or using mechanical means for making and cleaning drains.

TABLE XIII

CANE YIELDS RELATIVE TO TWO SUCCESSIVE CROPS = 100

Estate	Variety	No. of trials	Yield for two successive years (TC/A)	Two Year Crop			
				Cwt. per acre Sulphate of Ammonia			
				0	0·75	1·50	3
Appleton	B43214	1	53·23	88	—	68	74
	B4362	1	58·92	70	—	83	87
	B41227	1	51·92	52	—	50	52
	Average		54·67	70	—	68	72
Frome	B4362	4	62·71	56	67	50	—
	B41227	3	68·30	64	66	69	—
	Average		65·11	60	67	59	—

The results indicate that high losses in cane yield are experienced when cane is cut every two years instead of annually, on unirrigated estates, and these losses cannot be offset by sulphate of ammonia applications. They amount to about 30% and are accounted for by canes which died and were not fit for milling. It would appear that for the crop to be grown for two years under these conditions, varieties must be specially selected and/or crop growing conditions much more accurately controlled by reference to regular crop logging.

Analysis of the juice quality data shows that there is little difference in quality between the juice of two-year canes and that of annual canes. The relevant data are presented in Table XIV.

Survey of agricultural operations on five estates

Shortage of labour for certain types of agricultural operations and increased cost of labour have made it imperative that the output in tons sugar per men employed must be optimum. The logical approach for determining the direction in which economies might

(*f*) Chemical weed control has proven its worth not only economically but also as a time saver at Monymusk and Innswood. The other estates would be well advised to extend this system of weeding.

(*g*) The manpower requirements for producing a ton of plant cane are of the order of 4·5 to 9 man hours.

G. VARIETIES

Distribution

Half of the estates' acreage reaped for the 1957 crop was under B41227 and B4362; the former was clearly the dominant variety, occupying 29% of the acreage, and B4362, accounting for 21%, was the runner-up. The changes in the variety situation are shown in Table XV and illustrated in Figure 14:—

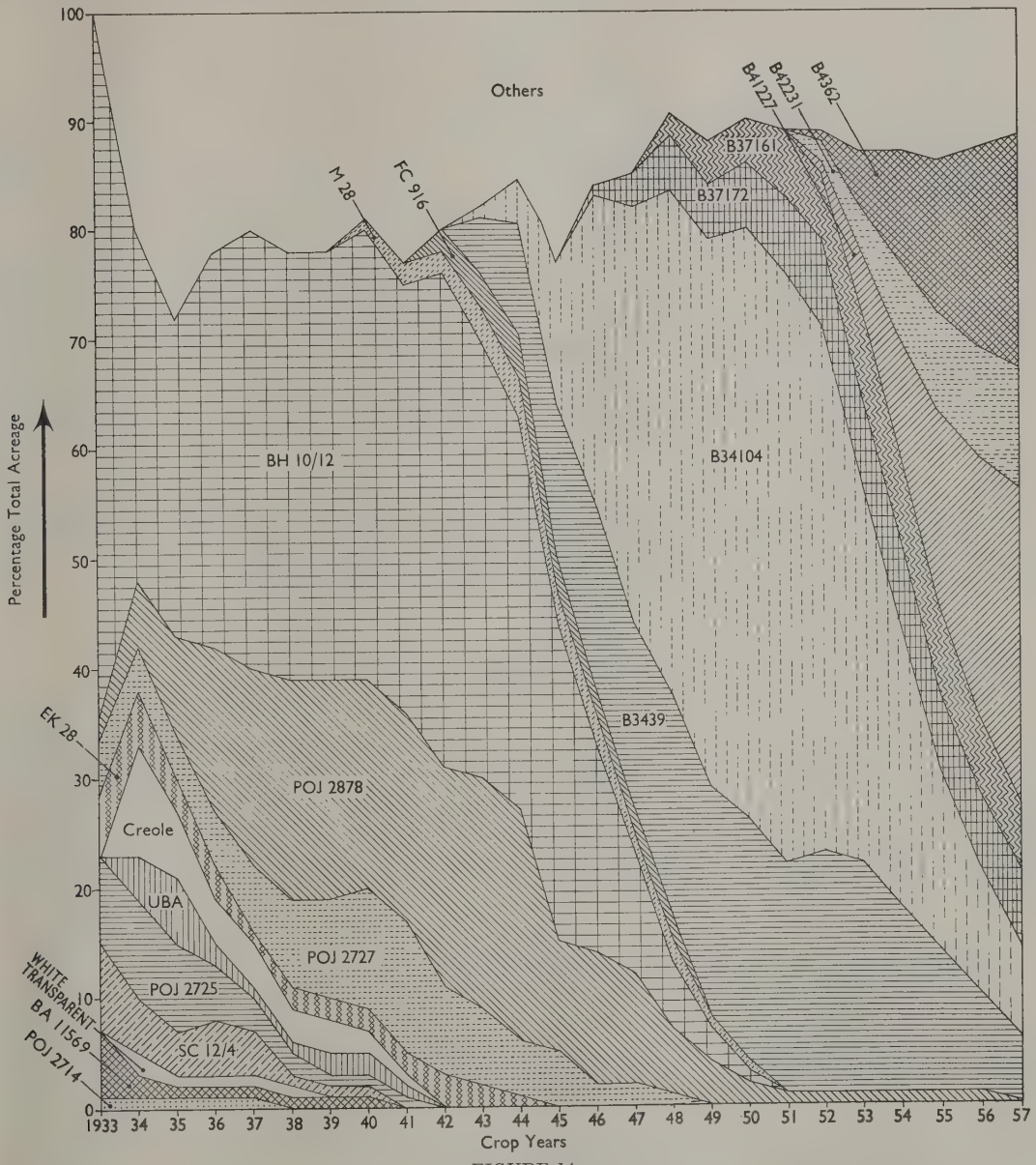


FIGURE 14
% Acreage under different varieties

TABLE XV

ACREAGE UNDER VARIETY PER CENT. TOTAL ACREAGE REAPED 1953 TO 1957

	VARIETIES										
Years	B3439	B34104	B37161	B37172	B41227	B42231	B4362	POJ2878	Co331	Co421	Others
1953	21	35	8	8	5	4	5	1	–	–	13
1954	18	26	8	8	10	7	10	1	–	–	11
1955	13	16	8	7	18	9	14	1	1	1	12
1956	9	11	7	7	24	10	18	1	2	1	10
1957	6	8	6	7	29	11	21	–	2	1	9

The decline in B3439, B34104 and B37161 continued though the decrease in the acreage of B37161 was not considerable. However, the percentage acreage under B3439 and B34104 shrank by approximately one-third and one-half respectively.

The percentage acreage reaped in each cane class from 1955 to 1957 is given in Table XVI:—

TABLE XVI

PERCENTAGE ACREAGE REAPED IN EACH CANE CLASS—1955 TO 1957

	CANE CLASSES					
Years	Fall plants	Spring plants	1st ratoons	2nd ratoons	3rd ratoons	Old canes
1955	6	14	21	21	14	24
1956	4	12	20	21	18	25
1957	3	10	16	20	18	33

The increase in old canes is marked and shows the effect of replanting restrictions in order to avoid overproduction. Besides achieving the desired result, this policy checked the spread of B41227 and B4362 which would doubtless now cover a much larger percentage of the total acreage had the rate of replanting not been reduced.

The importance of the varieties in the ecological areas is shown in Table XVII which gives the acreage under variety % total acreage reaped for estate ecological groups in 1956 and 1957.

The trends shown above are further illustrated in Table XVIII which gives the plant acreage under variety % total plant acreage reaped in 1956 and 1957.

B41227 and B4362 together dominate the variety situation in all areas except the Dry North Coast and the Wet Eastern areas. However, the plant acreage figures indicate that B41227 is increasing in importance in these regions. Unfortunately, the acute susceptibility of B4362 to chlorotic streak is eliminating it from the alluvial soils of Jamaica Sugar Estates. It is, however, being extended in the Dry North group, and the combined B4362 and B41227 plant acreage percentage exceeded fifty for the first time. B42231 was the only other clone planted to any extent. It is used mostly on the Irrigated Estates and is being increased on the Dry North estates.

B37172 remains the most popular variety in the Wet

TABLE XVII

ACREAGE UNDER VARIETY % TOTAL ACREAGE REAPED FOR ECOLOGICAL GROUPS—1956 AND 1957

	VARIETIES																					
	B3439		B34104		B37161		B37172		B41227		B42231		B43623		POJ2878		Co331		Co421		Others	
Ecological groups	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957
Wet West	2	1	20	14	9	8	3	3	35	38	2	2	22	28	—	—	1	—	—	—	6	6
Dry North	8	6	3	2	24	21	—	—	4	7	1	2	9	10	4	3	9	10	10	10	28	29
Irrigated	14	9	11	9	2	2	—	—	31	38	21	22	14	14	—	—	—	—	—	—	7	6
Wet East	10	7	1	—	3	2	48	45	3	6	—	—	24	29	—	—	—	—	—	—	11	11
Central	5	2	6	7	1	1	1	—	21	23	6	5	46	49	—	—	—	—	—	—	14	13
Average ..	9	6	11	8	7	6	7	7	24	29	10	11	18	21	1	—	2	2	1	1	10	9

TABLE XVIII

PLANT ACREAGE UNDER VARIETY PER CENT. TOTAL PLANT ACREAGE REAPED FOR ECOLOGICAL GROUPS—1956 AND 1957

	VARIETIES																					
	B3439		B34104		B37161		B37172		B41227		B42231		B4362		POJ2878		Co331		Co421		Others	
Ecological groups	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957
Wet West	—	—	—	1	—	—	—	1	59	41	4	2	33	48	—	—	2	—	—	—	2	7
Dry North	2	—	—	—	8	8	—	—	22	28	3	6	19	25	—	—	24	22	12	—	10	11
Irrigated	1	1	—	—	—	—	—	—	41	51	34	31	10	11	—	—	1	—	—	—	14	6
Wet East	—	3	—	—	—	—	28	23	12	24	3	3	55	37	—	—	—	—	—	—	2	10
Central	—	—	—	—	—	—	—	—	10	37	13	7	72	39	—	—	—	—	—	—	5	17
Average ..	1	1	—	—	1	1	3	3	39	42	18	16	27	27	—	—	3	2	—	—	8	8

East group. Although B37161 occupied the largest total acreage reaped on the North Coast, its position is being challenged by the newer standards and Co331, the acreages in these varieties being extended in plants.

Performance

The productivity of the main varieties is given in Table XIX which shows clearly the reason for the popularity of B41227 and B4362. On the Dry North estates Co331 did well and remains a very useful variety; B42231 did best of all in this area.

Other data on the performance of the varieties are presented in Appendix I. In general, B41227 was outstanding in vigour and B4362 in juice quality.

TABLE XIX

CWT. THEORETICAL 96° SUGAR PER ACRE PER MONTH FOR VARIETIES BY ECOLOGICAL GROUPS—1957

Ecological Groups	Varieties											Average
	B3439	B34104	B37161	B37172	B41227	B42231	B4362	POJ2878	Co331	Co421	Others	
Wet West	4·45	5·29	5·43	4·93	6·82	6·96	7·16	4·24	5·06	3·51	5·93	6·49
Dry North	4·60	3·99	5·04	—	5·73	6·17	5·57	4·40	5·96	5·09	4·83	5·16
Irrigated	6·18	5·73	5·75	—	6·42	6·20	6·95	6·11	4·01	6·25	6·07	6·32
Wet East	5·45	6·64	6·24	6·42	6·18	4·43	6·08	—	2·39	—	5·98	6·18
Central	5·43	5·54	6·58	5·31	7·85	7·30	8·11	—	—	—	7·04	7·59
Average	5·79	5·50	5·84	6·24	6·59	6·26	6·93	4·98	5·82	5·12	5·66	6·28

Variety experiments

The number and distribution of variety experiments in operation during 1957 are given in Table XX:—

TABLE XX

NO. AND DISTRIBUTION OF VARIETY EXPERIMENTS IN OPERATION DURING 1957

	Fall Plants			Spring Plants		Ratoons			Long Season Trials			
	Planted 1955	Planted 1956	Planted 1957	Planted 1956	Planted 1957	Reaped 1957			Reaped	To be reaped		
	Reaped 1957	To be reaped 1958	To be reaped 1959	Reaped 1957	To be reaped 1958	1st	2nd	3rd	1957	1958	1959	Total
Northern Division:												
Barnett	–	–	–	–	1	1	1	–	–	–	–	3
Hampden	1	2	–	–	–	1	–	–	–	–	–	4
Long Pond	–	1	–	–	2	2	–	–	–	–	–	5
Richmond/Llandovery	–	1	1	–	1	–	–	–	–	–	1	4
Rose Hall	–	–	–	–	2	1	2	–	–	–	–	5
Vale Royal	–	1	–	–	2	1	1	–	–	–	–	5
Central Division:												
Appleton	–	–	–	–	1	1	1	–	–	–	1	4
Frome	–	1	–	–	5	7	3	–	1	–	–	17
Holland	–	–	1	–	2	–	–	–	–	–	–	3
Monymusk	1	1	–	1	4	3	1	–	1	–	–	12
New Yarmouth	–	3	–	–	1	1	–	–	–	–	–	5
Sevens	–	1	–	–	2	–	–	–	–	–	1	4
Eastern Division:												
Bernard Lodge	–	–	–	–	2	–	–	–	–	–	–	2
Caymanas	1	1	–	–	1	–	–	–	1	–	–	4
Gray's Inn Central	1	–	–	–	1	1	–	–	–	–	–	3
Innswood	1	–	–	–	2	1	–	–	–	–	–	4
Jamaica Sugar Estates	–	1	–	–	2	–	1	–	–	1	–	5
Serge Island	–	–	–	–	2	2	–	–	–	–	–	4
United Estates	–	–	–	–	3	1	–	–	–	–	–	4
Worthy Park	–	–	–	–	1	1	–	–	–	–	–	2
Totals	5	13	2	1	37	24	10	–	3	1	3	99

(a) Final stage selection experiments

The results of the B47' and B51400 (= 1st 500) final trials are summarized in Table XXI.

(i) *The B47' Series.* B47258 and B47361 were again the best clones of this group, but neither was really outstanding. The former is being tried on a field scale by some estates.

(ii) *The B51400 Series.* Of the 23 varieties of this series, B51414, B51415 and B51418 are the most promising. The first two have been recommended for field trial by estates. B51414 is a very vigorous variety which may be late maturing; B51415 produces good juice and appears suited to high rainfall areas.

(iii) *The B49', B50' and B52400 (= 2nd 500) Series.* The experiments in which the varieties of the B49',

TABLE XXI

SUMMARY OF RESULTS OF FINAL EXPERIMENTS

No. of times varieties placed in first five (based on sugar yields)

Varieties	Irrigated		Wet East		Wet West		Dry North		Total	
	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons
B47258 ..	—	1 (4)*	0 (1)	1 (2)	—	1 (5)	—	1 (3)	0 (1)	4 (14)†
B47306 ..	—	—	1 (1)	0 (2)	—	1 (5)	—	1 (3)	1 (1)	2 (10)
B47310 ..	—	1 (2)*	—	—	—	—	—	—	—	1 (2)*
B47361 ..	—	2 (2)*	—	—	—	1 (1)	—	—	—	3 (3)*
B51402(A26) ..	—	2 (4)	—	0 (1)	—	0 (1)	—	1 (2)	—	3 (8)
B51403(A32)	—	1 (3)	—	—	—	—	—	—	—	1 (3)
B51407(E150)	—	2 (4)	—	—	—	—	—	—	—	2 (4)
B51410(E162)	—	1 (2)	0 (1)	2 (2)†	—	1 (5)	—	1 (3)	0 (1)	5 (13)†
B51411(E168)	—	0 (4)	—	1 (2)	—	0 (5)	—	2 (3)	—	3 (14)
B51413(F364)	—	2 (4)††	—	—	—	—	—	—	—	2 (4)††
B51414(G483)	—	1 (4)†	0 (1)	1 (2)†	—	4 (5)*	—	1 (3)*	0 (1)	7 (14)***††
B51415(H444)	—	—	1 (1)†	1 (2)†	—	3 (5)	—	0 (3)	1 (1)†	5 (10)††
B51417(1213) ..	—	1 (5)††	1 (1)	0 (2)	—	4 (5)	—	0 (3)	1 (1)	5 (15)††
B51418(1216)	—	2 (5)†	0 (1)	1 (2)	—	3 (5)	—	1 (3)	0 (1)	7 (15)*†
B51419(J284)	—	1 (3)†	—	—	—	—	—	—	—	1 (3)†

Figures in brackets represent number of experiments from which results were obtained

* Outyielded one standard † Outyielded all standards

B50' and B52400 (= 2nd 500) series are being tried will not be reaped until 1958. However, one trial was reaped at Richmond-Llandovery and B49119, in particular, did well. It surpassed B41227 in cane and sugar yields although the juice quality was inferior. The clone is slightly susceptible to mosaic. Other new varieties which have grown well are B5037 and B52405. NCo310 and H37/1933 are included in these experiments and both have been impressive in growth.

(b) Long season trials

Three experiments at Caymanas, Frome and Monymusk were reaped during the year. B41227 and B4362 were the leading varieties but the former tended to rot very badly. Of the other canes under trial, only NCo310, NCo330 and H37/1933 showed any promise.

(c) Lattice trials

The lattice trial results are condensed in Table XXII which gives the order of merit based on sugar yields.

(i) *The B51' Series.* Seven clones of this series have shown up quite well. B51131 which was outstanding in the two plant trials reaped in 1956, was disappointing in the experiments reaped in 1957. It produced excellent juice but was not vigorous. B51360 was vigorous but performed badly in a milling trial. B5121 and B51374 are attractive types.

(ii) *The B51400 Series.* The B51400s were imported from Barbados in two groups. Firstly, as the 1st 500 which were selected from the Seedling Nursery in 1949, and secondly, as the 3rd 500 which were selected from the First Year Seedling Trial in 1951.

TABLE XXII

SUMMARY OF RESULTS OF LATTICE TRIALS

No. of times varieties placed in first ten (based on sugar yields)

Varieties	Irrigated		Wet East		Wet West		Dry North		Central		Total	
	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons
B5121 ..	2 (3)	—	1 (1)	—	—	1 (1)	0 (1)	—	—	1 (1)*	3 (5)	2 (2)*
B51116 ..	0 (2)	—	1 (1)†	—	—	0 (1)	1 (1)*	—	—	1 (1)	2 (4)*†	1 (2)
B51131 ..	1 (2)	—	0 (1)	—	—	0 (0)	0 (1)	—	—	1 (1)*	1 (4)	1 (2)*
B51134 ..	2 (3)	—	1 (1)†	—	—	1 (1)	0 (1)	—	—	1 (1)*	3 (5)†	2 (2)*
B51259 ..	1 (1)†	—	1 (1)†	—	—	1 (1)	—	—	—	1 (1)*	2 (2)††	2 (2)*
B51360 ..	2 (2)	—	—	—	—	1 (1)	1 (1)†	—	—	—	3 (3)†	1 (1)
B51374 ..	1 (3)†	—	1 (1)†	—	—	1 (1)	1 (1)*	—	—	1 (1)	3 (5)*††	2 (2)
3/21 ..	1 (3)	—	0 (1)	—	—	1 (1)	1 (1)	—	—	1 (1)	2 (5)	2 (2)
3/206 ..	3 (3)	—	0 (1)	—	—	0 (1)	—	—	—	1 (1)	3 (4)	0 (2)
3/311 ..	0 (3)	—	1 (1)	—	—	0 (1)	1 (1)	—	—	0 (1)	2 (5)	1 (2)
3/377 ..	1 (2)†	—	1 (1)	—	—	1 (1)	0 (1)	—	—	1 (1)	2 (4)†	2 (2)

Figures in brackets represent number of experiments from which results were obtained

* Outyielded one standard † Outyielded all standards

Four have done well in cane yields but their juice quality is rather poor. 3/377 is a very strong ratooner and appears to be a promising variety.

(iii) *The B52' Series.* Two of the eight plant trials in which the B52s and the B52400s (= 4th 500 series) are being tried were reaped in 1957. B52257, B52298, B52371 and B52389 were vigorous but produced poor juice.

(iv) *The B52400 Series.* The B52400s were also imported in two lots. The 2nd 500 were taken from the Seedling Nursery in 1950 and the 4th 500 selected from the First Year Seedling Trial in 1952. In the two experiments harvested, 4/272, 4/352, 4/387 and 4/455 did well in both cane and sugar yields; 4/50 was vigorous but gave poor juice.

(v) *The B53' Series.* Twelve selections were planted in lattices during the year.

(vi) *The BJ54' Series.* The 58 selections of this series were included in trials. The varieties have been developed from the first lot of seedlings germinated in 1951–52.

(vii) *Foreign varieties.* Seventeen recently imported foreign varieties were planted in experiments. Of these, H44/3098 has been very impressive in growth.

Regional Propagation Nurseries

(*a*) The propagation nurseries planted at Barnett, Caymanas, Frome, Jamaica Sugar Estates and Monymusk provided ample supplies of planting material which germinated well in the experiments. Establishment of plots was good in general, and in only a few cases where dry weather was encountered was it necessary to replant or stock the trials. Inspection of the nurseries before cutting setts permitted a culling of some varieties.

In preparation for the 1958 variety experiment planting programme a new lot of nurseries were laid out in the summer. The varieties planted were:— B5277; B5387, B53200; B5401, B5463, B5480, B5490, B54142, B54163, B54172, B54193, B54262, B54281; BJ5410, BJ5413, BJ5425, BJ5428, BJ5429, BJ5446; as well as American varieties, CP34/79, CP34/120, CP36/105, CP36/111, CP44/154, F31/436; and Australian varieties Q47, Q50, Q56 and Q57.

(*b*) *The B55' Series.* The twelve second year seedling trial selections from Barbados have been propagated at Caymanas. They will be distributed to the other nurseries in the summer of 1958.

Pre-Lattice Selection Programme

(*a*) *Quarter-chain nurseries*

(i) *B53' and BJ56' Series.* The nurseries containing these varieties have grown well and will be reaped early in 1958.

(ii) *B54' and BJ57' Series.* The varieties selected from the five-stool nurseries reaped at Frome (B54s and BJ57s), Jamaica Sugar Estates (B54s and BJ57s), Long Pond (B54s), Monymusk (B54s and BJ57s) and Vale Royal (BJ57s) were planted in quarter-chain nurseries at Frome, Monymusk and Vale Royal. The other nursery at Jamaica Sugar Estates will be planted in 1958.

(*b*) *Five-stool nurseries*

(i) *The B54' Series.* These nurseries were reaped and selected during 1957. A total of ninety-three varieties was retained for further trial.

(ii) *The BJ57' Series.* Fifty-seven varieties of this series did sufficiently well in the five-stool nurseries to justify further trial.

(iii) *The B55' Series.* Three hundred and eighteen varieties of this series were planted in nurseries at Frome, Hampden, Jamaica Sugar Estates and Sevens early in the year. In general, germination was very poor.

(iv) *The BJ58' Series.* Two hundred and eight selections were made from the seedling nurseries at Frome and Sevens, and planted in five-stool nurseries at Frome and New Yarmouth. The number of nurseries was reduced in order to ensure better establishment through not having to stretch the limited supply of setts over four nurseries. The details of selection are presented in Table XXIII.

(v) *Hawaiian fuzz.* Table XXIII also gives details of the selections made from fuzz of four crosses received from Hawaii.

(*c*) *Single-stool nurseries*

(i) *The B56' Series.* The surviving 112 varieties of this series were planted in the Caymanas nursery. They were cut back in July so that suitable setts will be available to plant five-stool nurseries early in 1958.

(ii) *Parent varieties.* The fifty parent varieties will be sent to Long Pond, Jamaica Sugar Estates and Frome at the same time as the B56' series. Their field reaction to Eyespot, Chlorotic Streak and Mosaic will then be assessed.

(iii) *The BJ59' Series.* Twenty-two thousand, seven hundred and sixty-seven seedlings were planted at Frome and New Yarmouth. The parentage of the crosses received from Barbados and the number of seedlings potted are given in Table XXIV.

As the seedlings are usually ready for cutting and selecting in November when land is difficult to obtain, the nurseries were cut back in August and September. Thus the ratoon growth will not develop fully until February when land will be available.

(*d*) *New introductions*

The B57' Series. One hundred and seventy-seven varieties of this series were received in October. So far, eighteen have contracted mosaic. The remainder will be sent to Caymanas early next year.

H. DISEASES AND PESTS

The effects of fumigants upon crop response

Examination showed that the suspected nematode attack at Worthy Park was not obviously associated

TABLE XXIII

1955–56 Seedlings

Parentage	Planted			Developed Mosaic						Selected					
				Frome		Sevens		Total		Frome		Sevens		Total	
	Frome	Sevens	Total	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. B43349 x B47320 ..	133	120	253	2	2	1	1	3	1	1	1	5	6	6	2
2. B35207 x POJ2878 ..	48	63	111	6	13	—	—	6	5	1	2	2	3	3	3
3. H32/8560 x B45151 ..	399	316	715	28	6	9	3	37	5	12	3	6	2	18	3
4. H32/8560 x B4098 ..	80	81	161	8	10	7	9	15	9	—	—	3	3	3	2
5. H32/8560 x B34104 ..	89	74	163	15	17	7	10	22	13	1	1	7	10	8	5
6. B4431 x H32/1063 ..	4	—	4	—	—	—	—	—	—	—	—	—	—	—	—
7. POJ2878 x B41227 ..	197	197	394	8	4	4	2	12	3	—	—	14	7	14	4
8. POJ2878 x B4362 ..	399	370	769	11	3	3	1	14	2	4	1	15	4	19	2
9. POJ2878 x B34104 ..	304	119	423	19	6	9	8	28	7	9	3	10	8	19	4
10. B37161 x POJ2878 ..	120	100	220	8	67	2	2	10	5	1	1	3	3	4	2
11. B37161 x H37/1933 ..	80	12	92	27	34	—	—	27	29	—	—	—	—	—	—
12. B37161 x B41211 ..	40	64	104	—	—	1	2	1	1	—	—	6	10	6	6
13. B37172 x B41227 ..	24	19	43	—	—	—	—	—	—	—	—	1	5	1	2
14. B4362 x H37/1933 ..	133	103	236	10	8	3	3	13	6	—	—	1	1	1	—
15. B4362 x POJ2878 ..	252	224	486	2	1	—	—	2	—	1	—	8	4	9	2
16. B42279 x B4098 ..	240	245	485	49	20	7	3	56	12	1	—	11	5	12	2
17. B5037 x B41211 ..	623	449	1,072	125	20	33	7	158	15	5	1	23	5	28	3
18. F38/819 x B4744 ..	14	16	30	1	7	—	—	1	3	1	7	1	6	2	7
19. B39254 x B37193 ..	40	24	64	2	5	—	—	2	3	—	—	5	20	5	8
20. B39254 x B49119 ..	31	24	55	4	13	—	—	4	7	1	3	—	—	1	2
21. B45152 x H37/1933 ..	36	4	40	31	86	2	50	33	83	—	—	—	—	—	—
22. B37329 x B47419 ..	28	32	60	1	4	3	9	4	7	—	—	1	3	1	2
23. B50352 x POJ2878 ..	7	7	14	—	—	1	14	1	7	—	—	2	29	2	14
24. Co421 x NCo330 ..	98	135	233	3	3	2	2	5	2	—	—	2	2	2	1
25. M134/32 x B45151 ..	133	153	286	4	3	5	3	9	3	3	2	4	3	7	2
26. B37161 x NCo310 ..	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—
27. B4373 x B42231 ..	35	44	79	1	3	1	2	2	3	—	—	2	5	2	3
28. B42279 x B43337 ..	133	82	215	56	40	33	40	89	41	—	—	3	4	3	1
29. B51131 x B4098 ..	56	58	114	9	16	8	14	17	15	1	2	4	7	5	4
30. B3353 x B42231 ..	21	16	37	—	—	—	—	—	—	—	—	2	13	2	5
31. B51259 x B4098 ..	133	40	173	53	40	11	28	64	37	1	1	2	5	3	2
32. B5142 x B4098 ..	10	11	21	3	30	—	—	3	14	—	—	1	9	1	5
33. B5098 x POJ2878 ..	24	11	35	5	20	—	—	5	14	—	—	—	—	—	—
34. B38233 x B4098 ..	60	40	100	21	35	5	13	26	26	—	—	6	15	6	6
35. B50215 x B42231 ..	80	67	147	15	19	—	—	15	10	1	1	12	18	13	9
36. B52184 x B4098 ..	—	5	5	—	—	—	—	—	—	—	—	1	20	1	20
37. B37161 x B51134 ..	9	5	14	4	44	—	—	4	29	—	—	—	—	—	—
38. POJ2364 x B417 ..	24	19	43	4	17	2	11	6	14	1	4	—	—	1	2
Sub-Total	4,138	3,349	7,487	536	13	158	5	694	9	45	1	163	5	208	4
39. H44/2818 x ?	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
40. H41/3340 x ?	119	110	229	1	1	—	—	1	1	3	3	—	—	3	1
41. H44/2364 x ?	557	537	1,094	5	1	8	1	13	2	—	—	19	4	19	2
42. H40/1184 x ?	266	235	501	10	4	32	14	42	16	4	2	10	4	14	3
43. H47/2060 x ?	51	50	101	2	4	2	4	4	8	—	—	2	4	2	2
Sub-Total	993	932	1,925	18	2	42	5	60	6	7	1	31	3	38	2
Grand Total	5,131	4,281	9,412	554	11	200	5	754	15	52	1	194	5	246	3

with a soil inhabiting insect. The symptoms were essentially those of a stunted root sytsem, many of the newly developed roots being terminated in callouses, some of which had slight swellings. The succulent newly developing roots also showed abundant signs of pink staining usually around loci. The condition was worst in B4362 and such that the stand of sugar cane was most uneven in vigour and showed constant symptoms of drought even at short intervals after heavy downpours of rain.

During the year experiments were laid out to measure the beneficial effects, if any, of insecticides and nematacides at three levels of application and by two different methods of application.

The treatments were:—

	Rate per acre		
Insecticides			
B.H.C.	0	5	10 lb. active principle/acre
Deildrin	0	2	4 lb. " " "
Chlordane ..	0	2·5	5 lb. " " "
Fumigants			
Ethylene dibromide (EDB)	0	5	10 gal. (U.S.)/acre
Nemagon ..	0	5	10 gal. " "
D.D.	0	20	40 gal. " "

TABLE XXIV

1956–57 Seedlings

Parentage	Cross	Potted	Died or very weak	Mosaic		Planted in Nurseries		
				No.	%	Frome	New Yarmouth	Total
Ba11569 x CP38/34	8	32	0	10	31	13	9	22
B3439 x B37193	39	4,525	228	48	1	2,173	2,076	4,249
B34102 x B45151	43	180	24	2	1	71	83	154
B35206 x NCo310	13	1,241	86	285	23	540	330	870
B35207 x B53218	2	999	27	249	25	388	335	723
B35207 x POJ2878	4	365	34	2	0·5	174	155	329
B37161 x CP44/155	22	93	1	17	18	40	35	75
B37161 x B47419	9	848	116	198	23	350	184	534
B37161 x B51242	36	22	0	1	4	10	11	21
B37172 x B41211	27	192	1	16	12	48	64	112
B39157 x B47419	41	229	7	3	1	131	88	219
B39254 x B49119	11	51	0	10	20	22	19	41
B39254 x NCo310	17	51	8	20	39	—	23	23
B42304 x B37193	33	1,338	164	14	1	541	619	1,160
B42279 x B41211	42	784	60	4	0·05	377	343	720
B42304 x B49119	19	2,540	138	60	2	1,300	1,042	2,342
B4362 x B4098	30	277	0	44	16	128	105	233
B4362 x B43235	29	357	23	87	24	150	97	247
B4362 x B45236	25	539	5	37	7	259	238	497
B4362 x B52178	35	64	11	0	—	24	29	53
B4362 x CL41/223	24	204	4	78	38	80	42	122
B4362 x Co419	18	1,571	81	140	9	700	650	1,350
B43358 x B51353	37	198	44	13	7	72	69	141
B45137 x B4362	1	702	3	210	30	260	229	489
B45154 x B46364	14	2,700	19	645	24	1,009	1,027	2,036
B45170 x B41227	32	215	0	35	16	80	100	180
B4862 x B47419	38	61	3	0	—	24	34	58
B49353 x B41227	26	896	10	167	19	408	311	719
B49372 x B42231	21	148	56	19	13	40	32	72
B50151 x B41211	28	290	6	48	17	120	116	236
B5055 x B45151	23	143	53	6	4	46	38	84
B51311 x B4744	15	254	1	101	40	133	19	152
B51311 x B49119	40	465	8	136	29	179	142	321
B52371 x B41227	5	271	26	19	7	129	97	226
B53165 x B4744	10	257	10	44	17	118	85	203
Co360 x NCo310	16	780	8	110	14	190	472	662
Co421 x B4098	31	93	1	4	4	39	49	88
Co421 x B4995	12	637	63	22	3	290	262	552
H32/8560 x POJ2878	6	160	11	23	14	72	54	126
M134/32 x B41227	34	871	2	57	7	408	404	812
POJ2878 x B34104	20	200	30	3	2	85	82	167
POJ2878 x B41227	3	857	8	14	2	408	427	835
POJ3016 x B41227	7	590	70	8	1	265	247	512
Totals	—	27,227	1,450	3,009	11	11,894	10,873	22,767

The area was planted in Louisiana banks on a 6-ft. base, the planting taking place in the fully formed banks. The chemicals were therefore applied either before the land was banked or after the banks had been formed. The insecticides were sprayed on to the soil surface and the fumigants injected at 15 in. square centres at a depth of 6 in. prior to banking or in three rows of holes 15 in. apart along the banks after banking. Setts were planted ten days after the fumigants were applied.

The responses based upon the weight of an index leaf showed that all insecticides had a general beneficial effect of the order of 12%, an effect which was the same in both B4362 and B41227. On the other hand, the effects of fumigants were outstanding in both varieties but particularly so in the case of B4362 with the maximum response being obtained from D.D. at 40 gal. (U.S.) per acre applied to the land prior to banking.

A trial on a commercial scale using tractor mounted tyned applicators but without a metering pump, showed that very considerable responses can be obtained in commercially grown sugar cane by injecting banks three days prior to planting, the tynes being spaced at 15 in. apart, three tynes only to each bank, and D.D. being applied at 20 gal. (U.S.) per acre. At four months of age this treatment gave rise to a tenfold increase in the weight of sugar cane plants on the treated land compared with the untreated. The subsequent growth, however, has shown the importance of having proper metering and even distribution. Throughout the area of the experiments, fumigation will have meant the

difference between a hopeless crop failure and the makings of an economic crop.

The work is being extended to measure the responses to fumigants on a survey basis throughout the industry. Also, the effects of D.D. need to be studied further in order to evaluate how much of the response is due to general soil sterilization and how much to the control of soil micro fauna and soil pathogens. The problem is very likely the result of mono-culture and is related to the phenomenon of high yields recorded on virgin, but otherwise very marginal land.

I. CHEMICAL LABORATORY

The number and type of determinations dealt with in the chemical laboratory during the year are given in Table XXV:

factories delivered sugar in bulk for export over the Salt River bulk sugar terminal facilities of The West Indies Sugar Company Wharves Ltd.

The rate of milling underwent a further substantial increase at the expense of a minor drop in reduced pol extraction. The time account was the most unfavourable since 1948 and was the result of the prolonged labour strike during crop which had other adverse effects, such as utilization of growth time which would otherwise have been available for the 1958 crop, and the prolonging of cropping into weather which penalized juice quality, soil tilth and the 1958 crop. The average cane quality handled at 12·43 pol % cane, 82·29% mixed juice purity and 9·26 tons cane per ton 96° sugar, when reduced to the tons cane per ton 96° sugar calculated at arbitrary mill extraction

TABLE XXV

LABORATORY ANALYSES UNDERTAKEN DURING 1957

																	Total
1. SOIL ANALYSES:																	
	pH		Free $CaCO_3$		NaCl		Mechanical analysis		p.p.m. available P_2O_5	K_2O	Miscellaneous						
	453		1		128		39		324	324	2						1,271
2. LEAF, STALK AND SHEATH ANALYSES:																	
	% Dry matter																
	N		P_2O_5		K_2O		Mg		Total sugars		% Dry matter						
	3834		3761		4681		1560		923		430						15,189
3. JUICE ANALYSES:																	
							Brix		Pol		Purity						
							1084		1084		1078						3,246
4. SUGAR AND MOLASSES, ETC.:																	
							Brix		Pol or Sucrose		Total sugars						
Bulk loading:																	
Sugars							—		417		—				= 417		
Molasses							35		35		35				= 105		
Miscellaneous samples							—		6		—				= 6		
															—		528
5. MISCELLANEOUS ANALYSES:																	60
																	20,294

J. FACTORY DATA

Operational reports

Factory and distillery weekly reports as well as Final Reports were received, checked and circularized to the industry. A summary of factory performance together with comparisons of previous years' figures is given in the tables of Appendix III.

Improvement in factory equipment continued. Two factories installed new knives; one a new mill engine; two operated surplus bagasse incinerators; three installed new boilers; another a new crane for handling cane; one a new juice heater, one an automatic liming and pH control device; one a new battery of centrifugal separators; one a juice scale and two installed water cooled crystallizers; in addition to much miscellaneous minor equipment in many factories. Five

and boiling house efficiencies, compared closely with the average for the last ten years. The record rate of throughput was obtained at a slight loss in overall recovery of pol, the pol in bagasse being the highest since 1948, whilst undetermined loss at 1·98 was the highest since 1950.

Regression analysis as applied to data in factory reports

During the year, an opportunity was taken to analyse critically by methods of regression, the weekly factory control data of eight factories over the last seven crops. The results and main conclusions were presented in two papers at the 1957 Conference of the British West Indies Sugar Technologists and are summarized here.

The variations in weekly Brix of the 1st Expressed

Juice during a crop can be accounted for to the extent of 98·6% by seasonal trends in juice composition so that variations arising from all other causes, including the variable performance of the crusher, are very small indeed.

The same is generally true of Fibre % Cane in some factories whilst in others, much greater residual variance is encountered, strongly suggesting anomalies or errors in the mill control data.

The regression of Imbibition % Cane (I_c) upon the ratio of the Brix of the 1st Expressed Juice to the Brix of the Mixed Juice (B_1/B_m) was shown to fluctuate greatly between different factories, as were the constants to the regression equations. Up to 93% of the total variance can be accounted for by the regression in some factories, and as little as only 18 and 25% in others. By regressing the ratios of Imbibition weight/Cane weight; Mixed Juice weight/Cane weight and Imbibition weight/Mixed Juice weight against B_1/B_m useful estimates of the relative accuracies of the cane weights, juice scale and imbibition meter can be obtained. In factories giving high values for "r," highly consistent regressions are obtained in different crops, whilst in others, little consistency exists in the relationships between crops. The influence of Fibre % Cane upon the regressions is real but very small, and such as not to reduce greatly the value of the simpler regressions for Control Chart purposes.

The relationship between Absolute Brix and 1st Expressed Juice Brix (B_a/B_1) is as might be expected, very accurate in the case of some factories, with 99% of the variance being accounted for; and in such cases the assumption that $B_a/B_1 = 0{\cdot}95$ would fit the data very well. In the case of other factories, apparently anomalous correlations are obtained, such that "b" values of 0·83 to 0·88 are associated with "c" values of 1·40 and 1·85 and error variances of 15 and 30%. No evidence was obtained that, where fibre fluctuated greatly, any correction for Fibre % Cane improved the regressions.

Imbibition Factor (the proportion of imbibition water entering the mixed juice) as a function of Imbibition % Fibre is also highly significant but much more variable than either of the previous relationships. At the best, it only accounts for about 44% of the variance. Agreement between the data from different factories was shown to depend upon using a standard value for Imbibition Water in Bagasse/Total Water in Bagasse. Even when this correction was applied, the relationships between many factories remained anomalous, and sometimes impossible. The regression has value as a Control Chart when applied to the mean crop curve, but the fiducial bands are too wide to be of value in examining data week by week.

Because of the constancy of the ratio of Pol % Absolute Juice to Pol % 1st Expressed Juice (P_a/P_1), Java Ratio by definition, must be a negative, linear function of Fibre % Cane, and in many cases extremely significant relationships are obtained, even to accounting for 82% of the variance. On the other hand, factory data do exist which have little or no significance in the relationship, and which account for only between 1 and 10% of the variance. In the case of factories with wide variations in Fibre % Cane, a correction for Fibre/Pol ratio in cane improves the accuracy of the regression.

The residual Juice Factor (Brix 1st Expressed Juice/Brix Residual Juice) was shown to be a logarithmic function of Imbibition % Fibre, such that at normal applications of Imbibition Water (say between 100 and 200% Fibre) its value lay between $0{\cdot}7 \pm 0{\cdot}12$ and $0{\cdot}58 \pm 0{\cdot}13$. The standard error of the weekly factory ratios plotted at the mean Imbibition % Fibre against the above relationship, has value as a Control Chart and showed in the case of some of the factories examined, abnormally (and sometimes impossibly) great variations.

From an examination of the various regressions for all the factory data studied, it appears that in distinguishing between factories, Java Ratio as a function of Fibre % Cane is the most useful, followed by Imbibition % Cane as a function of B_1/B_m, then by Imbibition Factor as a function of log Imbibition % Fibre, and finally by Brix Absolute Juice as a function of Brix 1st Expressed Juice, and Residual Juice Factor as a function of Imbibition % Fibre.

The best estimates of the relationships based upon the data of a single weekly factory report, which may have to be modified in the light of further study, are given by:

Java Ratio = (94 − Fibre % Cane) ± 1·0
Imbibition % Cane = (88 B_1/B_m − 87) ± 1·0
Imbibition Factor = (0·548 $\log_{10}$ Imbibition % Fibre − 0·531) ± 0·08
Brix Absolute Juice = (0·95 Brix 1st Expressed Juice) ± 0·8

whilst the mean ratio of the Residual Juice Factor over a twenty-week crop should fall near the curve given by:—

Residual Juice Factor = (1·48 − 0·39 $\log_{10}$ Imbibition % Fibre)

and with a standard error not greater than ± 0·13.

The investigation has shown that great variations exist in the nature of the regression inherent in the mill control data of many Jamaican factories and that some explanation of this is needed. A greater understanding of the subject can only be obtained by factory chemists keeping Control Charts and recording the circumstances under which apparent anomalous data are obtained. In this way, the accuracy of the chemist's control can be improved and the condition leading to error or anomalies, understood, and anticipated. Similar methods of analysis might also prove invaluable if applied to other factory data and it is hoped that this will be done.

Examples of some regressions obtained from the figures of the factory with the most consistent data are given in Figures 15, 16 and 17.

Bulk loading—the accuracy of scales used for check weighing sugar at wharves

An investigation into the accuracy of small platform scales of between 200 and 1,000 lb. capacity used for check weighing bagged sugar at wharves was undertaken with respect to the sensitivity and accuracy of

each scale and the contribution made to each of these by:—

(*a*) the graduation of the scale;

(*b*) the repeated shifting of a scale and its subsequent placing into position;

(*c*) any other factors including personal error and inconsistencies of the operator.

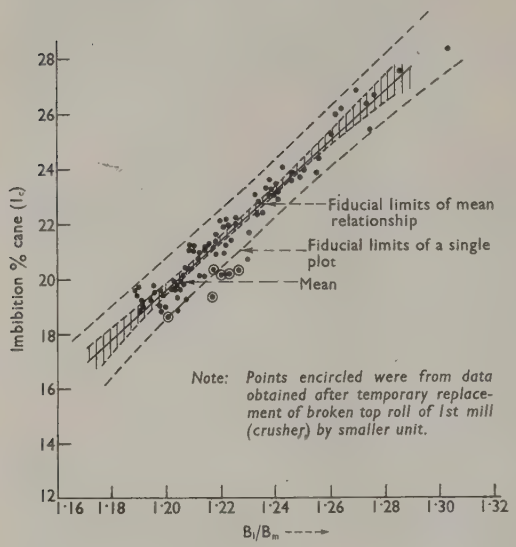


FIGURE 15

The relationship between B_1/B_m and Imbibition % Cane for the factory with the most consistent data

The accuracy is usually better than $\pm$ 0·5 lb. which is influenced to more than 50% by variability introduced from the shifting of scales from place to place; by about 30% from the graduations of the scale, and by not more than 15% imparted by personal error of the testing operator and all other influences. With proper manipulation on the part of the weigher and with truly unbiased selection of the bags on the basis of one in ten irrespective, the scales are entirely suitable for the work of checking the weight of sugar in bags.

The average sensitivity of the scales is such that 12 oz. too much or too little deflects the beam through its maximum range and therefore it should be possible for a weigher who consistently weighed too heavy to incur an error of 0·75 lb. or more. Sensitivity is influenced equally by scale movement from place to place and by scale graduation, but only to the extent of 25% by all other factors including the personal influence of the testing operator.

For accurate work, scales must be properly levelled in a sheltered position and calibrated or checked after levelling, and at intervals of 2 hours. The greatest

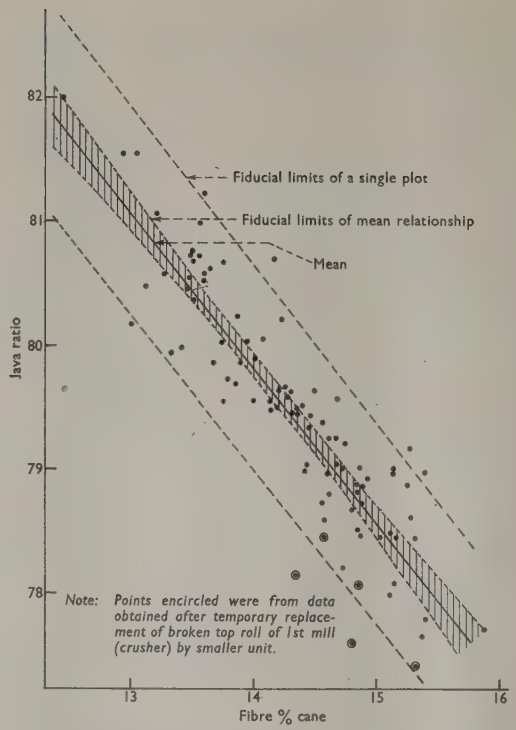


FIGURE 16

The relationship between Java Ratio and Fibre % Cane for factory with the most consistent data

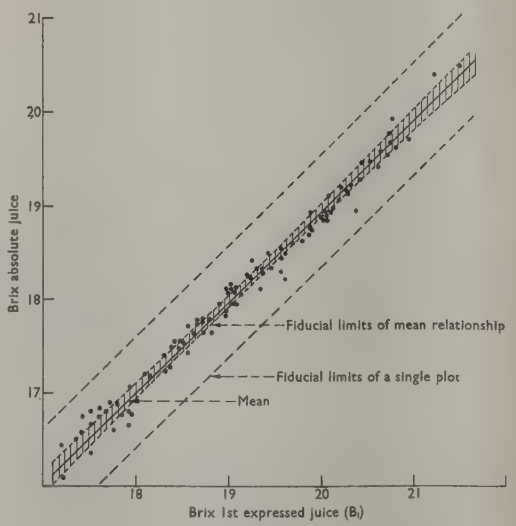


FIGURE 17

The relationship between Brix Absolute Juice and Brix 1st Expressed Juice for factory with the most consistent data

source of potential error in check weighing sugar arises not from the scales used but from differences between different operators; they should be consistent and conscientious.

K. ACKNOWLEDGEMENTS

The keen manner in which all estates' personnel helped with the laying out and reaping of experiments is gratefully acknowledged, as is the co-operation which was so freely given by the Research Officers of Bernard Lodge, Frome, Jamaica Sugar Estates, Monymusk, Vale Royal and Worthy Park. The assistance rendered by New Yarmouth in the early stages of variety selection was particularly helpful.

APPENDIX I

CANE YIELD SURVEY

TABLE I

Island Cane Crop for Past Ten Years

Crop year	Cane Ground						
	Total tonnage	% increase or decrease on previous crop	Tons purchased	% increase or decrease on previous crop	Tons estates	% increase or decrease on previous crop	Purchased cane % total
1948	1,882,181	15·5	518,604	2·5	1,363,577	21·4	28
1949	2,212,220	17·5	637,346	22·9	1,574,874	15·5	29
1950	2,474,754	11·9	764,054	19·9	1,710,700	8·6	31
1951	2,425,748	— 2·0	765,814	0·2	1,659,934	— 3·0	32
1952	2,468,902	1·8	819,371	0·7	1,649,531	— 0·6	33
1953	2,133,752	26·9	1,175,056	43·4	1,958,706	18·7	37
1954	3,503,788	11·8	1,380,096	17·5	2,123,692	8·4	39
1955	3,564,881	1·7	1,383,855	0·3	2,181,026	2·7	39
1956	3,219,977	— 9·7	1,209,410	—12·6	2,010,567	— 7·8	38
1957	3,394,278	5·4	1,297,132	7·3	2,097,146	4·3	38

In the above table the tonnages are for cane actually ground in the factories. They include cane, the juice from which was sent direct to the distilleries for rum manufacture.

TABLE II

Acreage Reaped by Each Estate Crops 1948–1957

Estates	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Appleton	570	1338	1301	1217	1538	1536	2029	2243	2263	2483
Barnett	839	781	791	852	786	817	834	944	954	973
Bernard Lodge	3332	4214	4358	4780	5061	4678	4925	4127	3733	3820
Caymanas	2709	2565	2597	2720	2879	2835	2963	2905	2513	2722
Frome	6999	7268	7971	8687	8975	9774	10100	10177	10205	10782
Gray's Inn	1636	1802	1934	1873	1903	1956	1954	2013	1929	1954
Green Park	458	453	—	—	333	500	—	—	—	—
Hampden	1484	1616	1566	1706	1847	2112	2443	2678	2538	2462
Holland	538	607	741	826	896	1018	1108	1223	1228	1296
Innswood	1837	1874	1894	2065	2208	1809	2168	1940	2219	2059
Ironshore	628	688	744	752	—	—	—	—	—	—
Jamaica Sugar Estates	2533	2544	2976	2884	2914	2938	3137	3177	3078	2954
Long Pond	1223	1617	1722	1842	1824	1803	1846	1836	1783	1674
Monymusk	6988	8676	11356	11996	12730	12963	13668	14590	13375	12821
New Yarmouth	1985	2464	2886	3347	3782	3584	3747	3504	3618	3433
Richmond/Llandovery	1067	1230	1322	1497	1429	1461	1482	1505	1529	1569
Rose Hall	1102	1110	1114	1152	1190	1231	1291	1335	1486	1314
Serge Island	1162	1125	1182	1228	1311	1288	1347	1339	1531	1370
Sevens	1432	1483	1635	1584	1851	2095	2107	1942	1834	1915
United Estates	1345	1411	1395	1597	1926	1747	1948	1925	1823	2156
Vale Royal	1614	1650	1635	1766	1769	1977	2126	2162	2176	2180
Worthy Park	1270	1218	1223	1146	1161	1195	1273	1276	1277	1202
Total	43999	48214	52343	55517	58213	59317	62496	62841	61092	61139
* Kew	436	480								
* Raheen	812	—								
Total	1248	480								

* Raheen amalgamated with Appleton and Kew operating as cane farmers.

TABLE III

TONS CANE PER ACRE BY ESTATES FOR CROPS 1948–1957 ALSO TEN YEAR AVERAGE

Year	Apple-ton	Bar-nett	Ber-nard Lodge	Cay-manas	Frome	Gray's Inn Cent.	Green Park	Hamp-den	Hol-land	Inns-wood	Jamaica Sugar Estates	Long Pond
1948	20·5	29·2	38·6	31·1	31·2	34·5	15·8	20·6	26·7	26·1	35·9	16·6
1949	22·0	28·6	32·4	32·3	37·3	36·3	13·0	19·6	29·5	34·1	45·3	16·9
1950	26·5	34·8	39·1	37·9	34·5	29·8	—	21·3	31·5	34·0	33·6	20·7
1951	23·8	30·5	35·6	34·1	30·6	27·6	—	26·1	25·8	32·2	35·9	20·3
1952	15·9	29·4	28·5	31·5	30·3	30·8	16·2	20·3	20·1	28·2	33·8	17·2
1953	26·1	32·7	29·7	35·2	35·3	31·3	15·5	25·5	30·2	35·0	39·9	25·3
1954	34·3	35·4	31·0	41·7	35·8	32·8	—	23·1	30·9	33·5	36·2	21·3
1955	23·6	32·1	35·1	41·3	29·8	29·4	—	27·8	28·5	37·5	36·1	31·7
1956	28·6	28·0	29·3	39·9	30·5	32·7	—	21·1	23·0	32·5	33·4	27·2
1957	29·2	29·2	33·6	39·5	38·3	29·1	—	25·9	28·6	34·7	37·1	30·0
10 year average	26·0	30·9	33·1	36·5	33·4	31·4	15·1	23·5	27·8	32·7	36·4	22·9

Year	Mony-musk	New Yar-mouth	Rich-mond/ Lland-overy	Rose Hall	Serge Island	Sevens	United Estates	Vale Royal	Worthy Park	Island average	Total acres
1948	39·7	42·1	25·1	20·0	29·4	28·9	26·1	20·9	28·9	31·1	43,996
1949	40·8	33·6	32·0	21·4	32·2	33·7	25·0	19·2	27·6	32·7	48,211
1950	35·4	35·0	29·5	21·7	28·2	35·9	28·3	21·4	31·9	32·6	52,340
1951	30·9	34·3	23·9	21·2	26·0	33·1	26·1	22·5	22·8	29·9	55,515
1952	30·2	31·3	29·3	20·9	24·2	30·1	23·5	25·0	23·0	28·3	58,212
1953	36·9	34·2	24·8	18·4	31·7	37·2	31·0	28·0	35·5	33·0	59,316
1954	37·1	35·4	36·1	23·4	31·4	35·1	33·5	24·5	37·4	34·0	62,494
1955	41·0	36·7	33·4	23·9	36·5	40·7	31·2	34·5	36·6	34·8	62,840
1956	39·3	36·9	31·7	24·8	27·9	36·7	35·0	32·0	36·0	33·0	61,089
1957	38·0	32·4	30·4	24·0	27·4	35·0	37·5	25·6	37·1	34·3	61,139
10 year average	36·8	34·9	29·7	22·1	29·5	34·9	30·2	25·8	31·8	32·4	—

TABLE IV

TONS CANE PER TON THEORETICAL 96° SUGAR BY ESTATES FOR 1953–1957

Estates	1953	1954	1955	1956	1957
Appleton	7·92	9·26	7·88	7·86	8·41
Barnett	8·76	8·70	8·08	7·73	7·90
Bernard Lodge	8·64	8·37	7·98	7·83	7·84
Caymanas	8·69	8·87	8·31	8·48	8·71
Frome	9·26	9·44	7·89	8·12	9·10
Gray's Inn Central	10·52	10·63	9·68	9·68	9·08
Hampden	8·84	9·28	8·34	7·71	8·12
Holland	8·91	10·09	8·10	9·00	8·32
Innswood	8·90	9·34	8·12	8·66	8·35
Jamaica Sugar Estates	9·75	9·35	8·20	8·63	8·60
Long Pond	9·28	9·55	8·89	8·80	8·87
Monymusk	8·95	8·96	9·17	9·08	9·53
New Yarmouth	8·89	8·88	8·40	8·38	8·95
Richmond/Landovery	8·35	9·06	8·73	8·52	8·41
Rose Hall	8·41	8·22	8·28	7·98	8·56
Serge Island	7·97	8·46	7·59	7·94	7·86
Sevens	8·78	8·69	8·67	8·70	8·57
United Estates	8·11	8·57	7·80	7·84	8·01
Vale Royal	8·96	9·13	8·62	8·42	8·50
Worthy Park	7·45	7·59	7·01	7·22	8·31
Average	8·95	9·03	8·43	8·46	8·75

Figures quoted are theoretical—based on 100 B.H.E. and 97% Pol Extraction.

TABLE V

TONS THEORETICAL 96° SUGAR PER ACRE BY ESTATES FOR 1953–1957

Estates	1953 (theoretical)	1954 (theoretical)	1955 (theoretical)	1956 (theoretical)	1957 (theoretical)
Appleton	3·29	3·70	3·00	3·64	3·47
Barnett	3·73	4·07	3·97	3·62	3·70
Bernard Lodge	3·44	3·70	4·40	3·74	4·29
Caymanas	4·05	4·70	4·97	4·70	4·54
Frome	3·81	3·79	3·78	3·75	4·21
Gray's Inn Central	2·98	3·09	3·03	3·38	3·20
Hampden	2·88	2·49	3·33	2·73	3·19
Holland	3·39	3·95	3·52	2·56	3·44
Innswood	3·93	3·58	4·62	3·75	4·16
Jamaica Sugar Estates	4·09	3·88	4·41	3·88	4·11
Long Pond	2·73	2·23	3·57	3·09	3·38
Monymusk	4·12	4·14	4·47	4·32	3·99
New Yarmouth	3·85	3·98	4·37	4·40	3·62
Richmond/Llandovery	2·97	3·98	3·82	3·72	3·61
Rose Hall	2·19	2·85	2·88	3·11	2·80
Serge Island	3·98	3·71	4·81	3·52	3·49
Sevens	4·22	4·04	4·69	4·22	4·08
United Estates	3·82	3·91	3·97	4·46	4·68
Vale Royal	3·12	2·68	4·00	3·80	3·01
Worthy Park	4·77	4·93	5·22	4·98	5·27
Average	3·69	3·76	4·12	3·90	3·92

TABLE VI

CWTS. THEORETICAL 96° SUGAR PER ACRE PER MONTH BY ESTATES FOR 1953–1957

Estates	1953	1954	1955	1956	1957
Appleton	5·56 **(96)** (93)	5·26 **(87)** (87)	5·49 **(86)** (92)	6·26 **(96)** (96)	5·96 **(95)** (92)
Barnett	5·54 **(96)** (93)	6·19 **(103)** (102)	6·42 **(100)** (108)	6·11 **(93)** (93)	6·06 **(96)** (93)
Bernard Lodge	5·72 **(99)** (93)	5·91 **(98)** (91)	6·43 **(100)** (94)	6·81 **(104)** (98)	6·41 **(102)** (101)
Caymanas	6·43 **(111)** (104)	6·98 **(116)** (107)	7·63 **(119)** (112)	7·48 **(114)** (108)	6·90 **(110)** (109)
Frome	5·90 **(102)** (99)	6·23 **(103)** (103)	6·09 **(95)** (102)	6·85 **(105)** (105)	6·73 **(107)** (104)
Gray's Inn Central	5·96 **(103)** (100)	5·28 **(88)** (87)	4·87 **(76)** (82)	5·63 **(86)** (93)	5·04 **(80)** (82)
Hampden	4·24 **(73)** (101)	3·67 **(61)** (90)	4·83 **(75)** (92)	4·36 **(67)** (83)	5·03 **(80)** (97)
Holland	5·21 **(90)** (87)	6·30 **(104)** (104)	4·77 **(74)** (80)	4·76 **(73)** (73)	5·70 **(91)** (88)
Innswood	5·90 **(102)** (96)	5·67 **(94)** (87)	6·26 **(98)** (92)	6·04 **(92)** (87)	5·99 **(95)** (95)
Jamaica Sugar Estates	6·73 **(116)** (113)	6·30 **(104)** (104)	6·91 **(108)** (116)	6·51 **(100)** (108)	7·10 **(113)** (115)
Long Pond	3·86 **(67)** (92)	4·02 **(67)** (99)	5·38 **(84)** (103)	5·47 **(84)** (104)	5·54 **(88)** (107)
Monymusk	6·37 **(110)** (103)	6·73 **(112)** (103)	7·22 **(112)** (106)	7·09 **(108)** (102)	6·29 **(100)** (100)
New Yarmouth	5·55 **(96)** (90)	6·48 **(107)** (99)	6·43 **(100)** (94)	6·55 **(99)** (95)	5·81 **(93)** (92)
Richmond/Llandovery	5·14 **(89)** (86)	5·93 **(98)** (98)	6·21 **(97)** (104)	6·15 **(94)** (102)	6·06 **(96)** (98)
Rose Hall	3·48 **(60)** (83)	4·75 **(78)** (116)	4·76 **(74)** (91)	5·22 **(80)** (99)	4·70 **(75)** (91)
Serge Island	6·32 **(109)** (106)	5·89 **(98)** (98)	6·34 **(99)** (106)	5·52 **(84)** (91)	6·13 **(98)** (99)
Sevens	6·76 **(117)** (110)	7·07 **(117)** (108)	7·28 **(113)** (107)	7·12 **(109)** (103)	6·81 **(108)** (108)
United Estates	6·05 **(105)** (102)	5·88 **(98)** (97)	6·79 **(106)** (114)	7·22 **(110)** (93)	7·20 **(115)** (95)
Vale Royal	4·98 **(86)** (118)	4·34 **(72)** (106)	6·19 **(98)** (118)	6·26 **(96)** (119)	5·28 **(84)** (102)
Worthy Park	7·92 **(137)** (133)	8·27 **(137)** (137)	8·67 **(135)** (145)	8·65 **(132)** (111)	8·31 **(132)** (109)
Average	5·78	6·03	6·42	6·54	6·28

Bold figures in brackets = cwt. theoretical sugar per acre per month expressed as a percentage of the island average in the same year.
Light figures in brackets = cwt. theoretical sugar per acre per month expressed as a percentage of the average for the ecological area in the same year.

TABLE VII

TOTAL ACREAGE UNDER VARIETY % TOTAL ACREAGE REAPED BY ESTATES AND ECOLOGICAL GROUPS FOR 1953–1957

Estates	B3439					B34104					B37161					B37172					B41227				
	'53	54	55	56	57	'53	54	55	56	57	'53	54	55	56	57	'53	54	55	56	57	'53	54	55	56	57
Appleton	—	—	—	—	—	84	49	36	15	8	—	3	3	2	2	4	20	19	19	19	—	14	23	42	40
Barnett	38	30	25	20	11	1	1	—	—	—	58	55	56	46	41	—	2	1	2	2	1	2	5	8	10
Frome	—	—	—	—	—	61	53	37	21	14	13	12	11	9	8	—	—	—	—	—	11	15	27	40	44
Holland	11	9	5	3	—	51	49	42	35	32	—	—	—	—	—	—	—	—	—	—	—	—	5	7	9
Wet West Estates	3	2	2	2	1	59	49	35	20	14	13	12	12	9	8	1	3	3	3	3	8	13	23	35	38
Hampden	1	1	1	1	1	—	—	—	—	—	36	31	28	26	22	—	—	—	—	—	—	—	1	1	2
Long Pond	7	8	6	7	5	35	25	15	8	4	27	27	29	31	25	—	—	—	—	—	—	—	—	1	3
Rose Hall	59	55	44	28	26	19	16	11	7	6	8	13	15	15	16	—	—	—	—	—	—	—	5	12	23
Vale Royal	12	7	6	3	2	9	4	1	—	—	26	25	21	22	20	—	—	—	—	—	—	1	3	4	4
Dry North Coast	16	13	10	8	6	15	10	6	3	2	26	25	24	24	21	—	—	—	—	—	—	—	2	4	7
Bernard Lodge	14	9	7	6	4	66	55	37	28	18	6	8	7	6	6	—	—	—	—	—	1	4	8	9	10
Caymanas	36	36	34	30	22	29	15	7	1	—	—	2	3	3	2	—	1	—	—	—	—	—	—	4	5
Innswood	6	2	1	1	1	69	75	78	74	69	—	—	—	—	—	—	—	—	—	—	5	5	6	15	19
Monymusk	25	21	14	6	2	31	15	4	1	—	4	3	3	1	1	1	—	—	—	—	9	21	39	51	64
New Yarmouth	50	51	42	33	22	36	16	6	3	1	2	3	3	3	1	—	—	—	—	—	1	15	18	19	20
Sevens	72	68	53	43	32	12	9	6	5	5	1	1	—	—	—	—	—	—	—	—	3	3	7	11	18
Irrigated Estates	30	26	20	14	9	38	26	14	11	9	3	3	3	2	2	1	—	—	—	—	5	13	24	31	38
Gray's Inn Central	15	14	11	7	7	8	4	4	4	1	—	—	—	—	—	56	51	43	42	36	—	—	—	—	—
Jamaica Sugar Estates	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	88	77	71	68	67	—	—	—	—	—
Richmond/Llandovery	62	52	48	39	21	6	4	2	1	1	16	18	16	15	9	—	—	—	—	—	—	4	8	16	32
Serge Island	20	20	11	6	4	10	4	—	—	—	—	1	—	—	—	65	65	76	65	59	2	1	1	1	—
Wet East Estates	19	17	14	10	7	5	2	1	1	—	3	3	3	3	2	59	54	52	48	45	—	1	2	3	6
United Estates	33	24	18	9	3	47	32	21	9	11	2	2	2	2	2	2	1	2	2	1	3	10	12	15	20
Worthy Park	4	1	1	—	—	20	5	—	—	—	6	1	—	—	—	1	2	—	—	—	11	16	24	28	27
Central Estates	21	15	11	5	2	36	21	13	6	7	3	2	1	1	1	2	1	1	1	—	6	12	17	21	23
Overall Average	21	18	13	9	6	35	26	16	11	8	8	8	8	7	6	8	8	7	7	7	5	10	18	24	29

TABLE VII—*continued*

Estates	B42231					B4362					Co331					Co421					Others				
	'53	54	55	56	57	'53	54	55	56	57	'53	54	55	56	57	'53	54	55	56	57	'53	54	55	56	57
Appleton	—	—	—	—	—	—	1	5	11	18	—	—	1	4	2	—	—	—	—	—	12	13	13	7	11
Barnett	—	—	—	—	—	—	5	6	11	23	—	—	—	—	—	—	—	—	—	—	2	5	8	13	13
Frome	1	2	3	3	3	13	17	20	26	30	—	—	—	—	—	—	—	—	—	—	1	1	2	1	1
Holland	—	—	—	—	—	3	10	15	22	27	—	—	—	—	—	—	—	—	—	—	35	32	33	33	32
Wet West Estates	1	1	2	2	2	10	14	16	22	28	—	—	—	—	—	—	—	—	—	—	5	6	9	6	6
Hampden	—	—	—	—	—	4	9	13	14	19	—	—	2	3	5	—	—	1	1	1	59	59	54	54	49
Long Pond	—	—	1	1	3	—	—	—	1	1	—	—	2	7	15	2	6	13	21	20	29	35	33	23	24
Rose Hall	—	—	—	—	—	—	1	3	2	2	—	—	1	4	5	—	—	—	—	—	14	14	21	32	22
Vale Royal	—	1	2	2	3	1	6	9	12	12	9	15	19	22	20	25	21	20	17	18	18	20	19	18	21
Dry North Coast	—	—	1	1	2	2	5	7	9	10	2	4	6	9	10	7	7	9	10	10	32	36	35	32	32
Bernard Lodge	1	7	15	24	33	6	13	21	23	25	—	—	—	—	—	—	—	—	—	—	6	5	5	4	4
Caymanas	1	8	17	28	38	5	14	20	25	26	—	—	—	1	—	—	—	1	1	1	29	24	18	7	6
Innswood	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	20	18	15	10	10
Monymusk	14	22	25	22	18	3	6	9	11	8	—	—	—	—	—	—	—	—	—	—	13	12	6	8	7
New Yarmouth	2	6	13	27	35	—	3	6	7	9	—	—	—	—	—	—	—	—	—	—	9	6	12	8	12
Sevens	—	—	—	5	5	3	9	26	30	33	—	—	—	—	—	—	—	—	—	—	9	10	8	6	7
Irrigated Estates	7	13	18	21	22	3	7	12	14	14	—	—	—	—	—	—	—	—	—	—	13	12	9	7	6
Gray's Inn Central	—	—	—	2	1	5	14	25	28	41	—	—	—	—	—	—	—	—	—	—	16	17	17	17	14
Jamaica Sugar Estates	—	—	—	—	—	6	15	20	26	26	—	—	—	—	—	—	—	—	—	—	6	8	9	6	7
Richmond/Llandovery	—	—	—	—	1	—	4	10	14	23	—	—	—	—	—	—	—	—	—	—	16	18	16	14	13
Serge Island	—	—	—	—	—	2	3	8	23	28	—	—	—	—	—	—	—	—	—	—	1	6	4	5	9
Wet East Estates	—	—	—	—	—	4	11	17	24	29	—	—	—	—	—	—	—	—	—	—	10	12	11	11	11
United Estates	1	4	6	7	7	1	9	25	42	44	—	—	—	—	—	—	—	—	—	—	11	18	14	14	12
Worthy Park	5	9	9	5	1	29	44	48	51	57	—	—	—	—	—	—	—	—	—	—	24	21	18	16	15
Central Estates	3	6	7	6	5	13	23	34	46	49	—	—	—	—	—	—	—	—	—	—	16	19	16	14	13
Overall Average	4	7	9	10	11	5	10	14	18	21	—	—	1	2	2	—	1	1	1	1	14	14	13	11	9

TABLE VIII

PLANT ACREAGE UNDER VARIETY % TOTAL PLANT ACREAGE REAPED BY ESTATES AND ECOLOGICAL GROUPS FOR 1953–1957

Estates	B3439					B37161					B37172					B41227				
	'53	54	55	56	57	'53	54	55	56	57	'53	54	'55	56	57	'53	54	55	56	57
Appleton	—	—	—	—	—	—	7	3	—	—	13	41	—	2	5	—	33	56	56	20
Barnett	37	16	—	—	—	63	37	43	4	—	—	7	—	—	—	—	4	14	35	21
Frome	—	—	—	—	—	16	3	—	—	—	—	—	—	—	—	31	46	76	62	52
Holland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43	20	22
Wet West Estates	2	2	—	—	—	16	8	3	—	—	1	17	—	—	1	25	34	66	59	41
Hampden	—	2	2	—	—	33	24	19	8	6	—	—	—	—	—	—	1	2	6	10
Long Pond	16	6	2	—	—	46	17	20	2	18	—	—	—	1	—	—	—	—	6	13
Rose Hall	64	35	20	6	—	14	27	15	17	—	—	—	—	—	—	—	—	21	44	100
Vale Royal	4	—	—	—	—	32	20	11	—	—	—	—	—	—	—	—	2	12	18	10
Dry North Coast	15	9	6	2	—	32	22	17	8	8	—	—	—	—	—	—	1	9	22	28
Bernard Lodge	11	7	—	—	—	10	14	—	—	—	—	—	—	—	—	2	15	21	7	17
Caymanas	36	21	11	13	3	—	6	—	—	—	—	3	—	—	—	—	—	1	15	10
Innswood	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	3	9	52	100	79
Monymusk	11	2	1	—	—	7	—	—	—	—	—	—	—	—	—	25	49	67	60	82
New Yarmouth	72	24	5	—	3	6	4	2	2	—	—	—	—	—	—	4	42	17	10	10
Sevens	59	8	2	—	—	3	—	—	—	—	—	—	—	—	—	13	—	15	22	60
Irrigated Estates	25	8	2	1	1	6	4	—	—	—	—	—	—	—	—	17	34	48	41	51
Gray's Inn Central	16	10	—	3	9	—	—	—	—	—	29	—	13	18	8	—	—	—	—	—
Jamaica Sugar Estates	—	—	—	—	—	—	—	—	—	—	63	3	31	52	88	—	—	—	—	—
Richmond/Llandovery	66	32	13	—	—	14	25	18	1	—	—	—	—	—	—	—	14	21	52	57
Serge Island	18	20	10	—	—	—	1	—	—	—	77	65	66	27	47	—	1	2	—	6
Wet East Estates	19	16	7	—	3	2	9	5	—	—	51	18	16	28	23	—	5	6	12	24
United Estates	39	3	—	—	—	8	—	5	—	—	3	4	—	—	—	12	33	5	14	40
Worthy Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	—	55	21	25
Central Estates	24	2	—	—	—	5	—	3	—	—	2	3	—	—	—	14	29	23	10	37
Overall Average	17	8	2	1	1	11	7	3	1	1	7	5	1	3	3	14	26	43	39	42

TABLE VIII—*continued*

Estates	B42231					B4362					Co331					Others				
	'53	54	55	56	57	'53	54	55	56	57	53	54	'55	56	57	'53	54	55	56	57
Appleton	—	—	—	—	—	—	3	20	21	47	—	—	6	10	—	87	15	15	11	28
Barnett	—	—	—	—	—	—	20	7	44	79	—	—	—	—	—	—	16	36	17	—
Frome	3	8	4	5	2	36	43	20	33	44	—	—	—	—	—	14	—	—	—	2
Holland	—	—	—	—	—	22	65	48	80	60	—	—	—	—	—	78	34	9	—	18
Wet West Estates	2	4	3	4	2	29	26	21	33	48	—	—	1	2	—	25	9	6	2	8
Hampden	—	—	—	4	—	10	22	30	24	54	—	2	11	2	14	57	49	36	56	16
Long Pond	—	—	7	—	9	—	—	—	6	4	—	1	13	33	49	38	76	58	49	7
Rose Hall	—	—	—	—	—	2	3	3	—	—	—	—	3	19	—	20	35	38	14	—
Vale Royal	—	3	12	9	30	3	22	12	46	33	15	28	21	10	—	46	25	26	17	27
Dry North Coast	—	1	4	3	6	4	14	13	19	25	5	9	11	24	22	44	40	29	22	11
Bernard Lodge	5	24	41	75	65	22	34	38	13	18	—	—	—	—	—	50	7	—	5	—
Caymanas	5	25	42	58	51	23	34	26	5	32	—	—	1	3	—	36	11	19	8	4
Innswood	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	66	91	48	—	19
Monymusk	30	34	18	20	11	10	12	12	10	—	—	—	—	—	—	17	3	2	10	7
New Yarmouth	8	12	31	68	63	—	10	17	10	7	—	—	—	—	—	10	8	28	10	17
Sevens	—	—	—	35	5	14	79	80	25	34	—	—	—	—	—	11	13	2	18	1
Irrigated Estates	18	26	23	34	31	12	19	21	10	11	—	—	—	—	—	22	8	6	14	6
Gray's Inn Central	—	—	—	15	5	28	75	70	64	60	—	—	—	—	—	27	15	17	—	18
Jamaica Sugar Estates	—	—	—	—	—	28	66	45	40	12	—	—	—	—	—	9	31	24	8	—
Richmond/Llandovery	—	—	—	1	3	—	13	34	36	28	—	—	—	3	—	20	16	14	7	12
Serge Island	—	—	—	—	—	5	3	20	73	47	—	—	—	—	—	—	10	3	—	—
Wet East Estates	—	—	—	3	3	17	35	49	55	37	—	—	—	—	—	11	17	17	2	10
United Estates	4	13	11	5	9	6	33	79	76	44	—	—	—	—	—	28	14	—	5	7
Worthy Park	13	68	—	33	—	55	32	33	64	17	—	—	—	—	—	22	—	12	3	58
Central Estates	12	20	7	13	7	11	33	62	72	39	—	—	—	—	—	32	13	5	5	17
Overall Average	9	15	14	18	16	17	23	24	27	27	—	—	2	3	2	25	16	11	8	8

TABLE IX

Tons Cane per Acre for Varieties by Estates and Ecological Groups, 1957 Crop

Estates	B3439	B34104	B37161	B37172	B41227	B42231	B4362	Co331	Co421	Mixed and others	Average
Appleton	—	22·3	22·3	24·0	31·5	—	32·0	32·6	—	30·5	29·2
Barnett	21·7	—	26·0	24·7	33·7	—	37·4	—	—	28·8	29·2
Frome	34·0	29·4	30·2	9·1	42·0	38·5	39·2	—	36·2	33·5	38·3
Holland	—	21·9	—	—	38·3	—	33·8	—	—	28·5	28·6
Wet West Estates	22·8	27·2	28·6	24·0	40·1	38·5	37·9	32·6	36·2	29·6	35·5
Hampden	25·9	—	24·6	—	31·8	32·5	28·5	31·8	30·7	24·5	25·9
Long Pond	26·8	23·3	28·2	—	52·5	36·0	35·1	38·3	29·5	25·8	30·0
Rose Hall	21·3	18·9	22·5	—	30·4	—	21·7	29·1	—	21·9	24·0
Vale Royal	25·2	18·9	25·6	—	31·2	31·0	26·2	25·7	23·1	25·4	25·6
Dry North Coast	22·8	20·7	25·5	—	32·6	32·9	27·7	30·4	26·1	24·6	26·4
Bernard Lodge	33·2	29·5	31·4	—	36·3	36·0	32·9	—	—	34·3	33·6
Caymanas	37·0	30·4	38·7	—	45·6	41·2	39·1	37·1	33·2	37·4	39·5
Innswood	32·0	32·9	—	—	40·8	—	35·8	—	—	36·2	34·7
Monymusk	34·2	34·9	31·5	—	40·2	30·9	40·6	21·9	—	35·8	38·0
New Yarmouth	28·9	31·1	33·0	—	31·1	35·0	33·3	—	—	34·0	32·4
Sevens	30·9	22·6	—	—	40·8	39·4	37·2	—	—	32·9	35·0
Irrigated Estates	32·3	31·4	31·7	—	39·6	34·7	37·1	28·7	33·2	35·3	36·4
Gray's Inn Central	28·9	32·6	—	27·9	—	20·1	29·9	—	—	29·8	29·1
Jamaica Sugar Estates	—	—	—	36·8	—	—	32·1	—	—	33·5	35·3
Richmond/Llandovery	27·3	38·8	29·9	—	32·4	30·6	32·0	14·9	—	27·7	30·4
Serge Island	22·3	—	—	27·1	29·9	—	28·7	—	—	27·5	27·4
Wet East Estates	27·2	35·1	32·6	32·8	32·3	25·4	30·8	14·9	—	29·9	31·4
United Estates	27·0	35·5	32·6	23·5	41·5	39·8	38·2	—	—	33·2	37·5
Worthy Park	—	—	—	—	38·5	27·7	36·6	—	—	37·0	37·1
Central	27·0	35·4	32·6	23·5	40·2	39·3	37·6	—	—	34·7	37·4
Overall Average	29·8	29·4	27·7	31·7	39·4	35·0	35·7	30·3	26·4	29·9	34·3

TABLE X

Tons Cane per Ton Theoretical 96° Sugar for Varieties by Estates and Ecological Groups, 1957 Crop

Estates	B3439	B34104	B37161	B37172	B41227	B42231	B4362	Co331	Co421	Mixed and others	Average
Appleton	—	8·96	8·78	8·37	8·48	—	7·93	9·97	—	8·45	8·41
Barnett	8·53	—	7·74	8·33	8·34	—	7·76	—	—	7·82	7·90
Frome	9·09	9·47	9·10	10·51	9·43	8·70	8·55	—	14·48	9·99	9·10
Holland	—	8·21	—	—	7·15	—	8·03	—	—	8·57	8·32
Wet West Estates	8·61	9·20	8·68	8·36	9·25	8·70	8·40	9·97	14·48	8·55	8·88
Hampden	8·14	—	8·08	—	7·67	7·91	7·99	8·31	8·37	8·19	8·12
Long Pond	8·75	9·28	8·66	—	9·18	8·89	8·20	9·13	8·99	8·74	8·87
Rose Hall	8·33	8·24	8·34	—	8·99	—	8·05	8·65	—	8·47	8·56
Vale Royal	8·56	9·78	8·52	—	8·63	8·42	8·23	8·60	8·54	8·44	8·50
Dry North Coast	8·43	8·75	8·39	—	8·80	8·54	8·09	8·73	8·77	8·37	8·48
Bernard Lodge	7·83	7·91	8·09	—	7·84	7·81	7·74	—	—	7·99	7·84
Caymanas	8·50	9·85	9·02	—	8·92	8·81	8·45	10·68	8·86	9·52	8·71
Innswood	8·26	8·36	—	—	8·36	—	8·24	—	—	8·25	8·34
Monymusk	8·80	9·54	9·71	—	9·75	9·06	8·95	10·17	—	9·45	8·87
New Yarmouth	9·07	10·80	9·14	—	9·14	8·70	8·61	—	—	9·32	9·53
Sevens	8·42	8·53	—	—	9·13	8·41	8·45	—	—	8·46	8·57
Irrigated Estates	8·61	8·30	8·58	—	9·53	8·62	8·44	10·46	8·86	9·11	8·96
Gray's Inn Central	9·39	8·93	—	9·30	—	8·85	9·01	—	—	8·65	9·08
Jamaica Sugar Estates	—	—	—	8·86	—	—	8·07	—	—	8·13	8·60
Richmond/Llandovery	8·20	8·55	8·06	—	8·67	9·20	8·41	8·31	—	8·20	8·41
Serge Island	7·67	—	8·69	7·91	8·55	—	7·67	—	—	7·99	7·86
Wet East Estates	8·45	8·76	8·08	8·72	8·66	9·05	8·34	8·31	—	8·29	8·53
United Estates	7·97	8·65	7·99	8·04	8·19	8·33	7·69	—	—	8·25	8·01
Worthy Park	—	—	—	—	7·31	7·18	6·84	—	—	7·38	7·05
Central	7·97	8·65	7·99	8·04	7·80	8·29	7·32	—	—	7·86	7·64
Overall Average	8·57	8·67	8·51	8·70	9·30	8·67	8·23	8·84	8·75	8·59	8·75

TABLE XI

Tons Theoretical 96° Sugar per Acre for Varieties by Estates and Ecological Groups, 1957 Crop

Estates	B3439	B34104	B37161	B37172	B41227	B42231	B4362	Co331	Co421	Mixed and others	Average
Appleton	—	2·49	2·54	2·87	3·71	—	4·04	3·27	—	3·61	3·47
Barnett	2·54	—	3·36	2·96	4·04	—	4·82	—	—	3·68	3·70
Frome	3·74	3·10	3·32	0·87	4·46	4·42	4·58	—	2·50	3·35	4·21
Holland	—	2·66	—	—	4·35	—	4·21	—	—	3·32	3·44
Wet West Estates	2·65	2·96	3·30	2·87	4·33	4·42	4·51	3·27	2·50	3·44	3·99
Hampden	3·18	—	3·05	—	4·14	4·11	3·57	3·83	3·67	2·99	3·19
Long Pond	3·06	2·51	3·25	—	5·72	4·05	4·28	4·19	3·28	2·95	3·38
Rose Hall	2·56	2·29	2·70	—	3·38	—	2·70	3·36	—	2·59	2·80
Vale Royal	2·95	1·93	3·00	—	3·62	3·68	3·18	2·99	2·70	3·01	3·01
Dry North Coast	2·70	2·37	3·04	—	3·71	3·85	3·42	3·48	2·98	2·94	3·11
Bernard Lodge	4·24	3·73	3·88	—	4·63	4·61	4·25	—	—	4·29	4·29
Caymanas	4·36	3·09	4·29	—	5·11	4·67	4·63	3·47	3·75	3·93	4·54
Innswood	3·87	3·93	—	—	4·88	—	4·35	—	—	4·39	4·16
Monymusk	3·89	3·66	3·24	—	4·13	3·41	4·54	2·15	—	3·78	3·99
New Yarmouth	3·18	2·88	2·51	—	3·40	4·02	3·86	—	—	3·65	3·62
Sevens	3·67	2·65	—	—	4·47	4·68	4·41	—	—	3·89	4·08
Irrigated Estates	3·75	3·79	3·69	—	4·15	4·03	4·40	2·74	3·75	3·87	4·06
Gray's Inn Central	3·08	3·65	—	3·00	—	2·27	3·32	—	—	3·44	3·20
Jamaica Sugar Estates	—	—	—	4·15	—	—	3·98	—	—	4·12	4·11
Richmond/Llandovery	3·33	4·54	3·71	—	3·73	3·32	3·81	1·79	—	3·38	3·61
Serge Island	2·91	—	3·36	3·43	3·50	—	3·74	—	—	3·44	3·49
Wet East Estates	3·22	4·01	3·70	3·76	3·73	2·80	3·69	1·79	—	3·60	3·68
United Estates	3·38	4·10	4·08	2·92	5·06	4·78	4·97	—	—	4·02	4·68
Worthy Park	—	—	—	—	5·27	3·86	5·35	—	—	5·01	5·27
Central	3·38	4·10	4·08	2·92	5·15	4·74	5·13	—	—	4·41	4·89
Overall Average	3·48	3·40	3·25	3·64	4·23	4·06	4·34	3·43	3·01	3·48	3·92

TABLE XII

Cwts. Theoretical 96° Sugar per Acre per Month for Varieties by Estates and Ecological Groups, 1957 Crop

Estates	B3439	B34104	B37161	B37172	B41227	B42231	B4362	Co331	Co421	Mixed and others	Average
Appleton	—	4·32	3·69	4·14	5·46	—	6·83	5·06	—	6·17	5·96
Barnett	4·23	—	4·23	4·05	6·43	—	7·81	—	—	6·32	6·06
Frome	6·88	5·64	4·99	2·09	6·90	6·96	7·22	—	3·51	5·69	6·73
Holland	—	4·56	—	—	6·62	—	6·62	—	—	5·69	5·70
Wet West Estates	4·45	5·29	5·43	4·93	6·82	6·96	7·16	5·06	3·51	5·93	6·49
Hampden	4·66	—	4·77	—	6·41	6·32	5·64	6·48	5·64	4·70	5·03
Long Pond	5·05	4·20	5·42	—	7·67	6·35	6·79	6·33	5·53	5·02	5·54
Rose Hall	4·42	3·88	4·62	—	5·29	—	4·08	5·72	—	4·47	4·70
Vale Royal	5·13	3·38	5·26	—	5·75	6·02	5·49	5·58	4·67	5·27	5·28
Dry North Coast	4·60	3·99	5·04	—	5·73	6·17	5·57	5·96	5·09	4·83	5·16
Bernard Lodge	6·54	5·85	5·91	—	6·67	6·72	6·34	—	—	6·48	6·41
Caymanas	6·88	5·14	6·75	—	7·46	6·86	7·12	5·45	6·25	6·13	6·90
Innswood	5·67	5·70	—	—	6·92	—	6·20	—	—	6·24	5·99
Monymusk	6·42	6·23	5·31	—	6·42	5·47	7·43	2·98	—	6·03	6·29
New Yarmouth	5·43	5·11	4·03	—	5·39	6·31	6·08	—	—	5·77	5·81
Sevens	6·21	5·27	—	—	7·08	7·45	7·39	—	—	6·50	6·81
Irrigated Estates	6·18	5·73	5·75	—	6·42	6·20	6·95	4·01	6·25	6·07	6·32
Gray's Inn Central	4·93	6·27	—	4·90	—	3·50	5·01	—	—	5·51	5·04
Jamaica Sugar Estates	—	—	—	7·19	—	—	7·00	—	—	6·61	7·10
Richmond/Llandovery	5·69	7·12	6·23	—	6·21	5·42	6·40	2·39	—	5·69	6·06
Serge Island	5·51	—	6·41	5·93	4·71	—	6·54	—	—	6·72	6·13
Wet East Estates	5·45	6·64	6·24	6·42	6·18	4·43	6·08	2·39	—	5·98	6·18
United Estates	5·43	5·54	6·58	5·31	7·43	7·32	7·87	—	—	6·60	7·20
Worthy Park	—	—	—	—	8·47	6·80	8·43	—	—	7·66	8·31
Central	5·43	5·54	6·58	5·31	7·86	7·30	8·11	—	—	7·04	7·59
Overall Average	5·79	5·50	5·34	6·24	6·59	6·26	6·93	5·82	5·12	5·66	6·28

TABLE XIII

Comparison of Varieties Showing Actual Yields and Expressed as a Percentage of B4362—1957 Crop

	B4362	B3439	B34104	B37161	B37172	B41227	B42231	Co331	Co421
Tons cane per acre per month	2·86 (100) 2·89 (100) 2·89 (100) 2·89 (100) 2·90 (100) 2·88 (100) 2·86 (100) 2·94 (100)	2·48 (87)	2·39 (83)	2·27 (79)	2·71 (94)	3·07 (106)	2·70 (94)	2·57 (90)	2·24 (76)
Cwt. sugar per acre per month	6·85 (100) 6·88 (100) 6·98 (100) 6·97 (100) 7·07 (100) 6·95 (100) 6·75 (100) 6·95 (100)	5·79 (85)	5·50 (80)	5·34 (77)	6·24 (90)	6·59 (93)	6·26 (90)	5·82 (86)	5·12 (74)
Tons cane per ton sugar	8·36 (100) 8·39 (100) 8·30 (100) 8·29 (100) 8·19 (100) 8·28 (100) 8·49 (100) 8·47 (100)	8·56 (98)	8·67 (97)	8·50 (98)	8·69 (95)	9·31 (88)	8·62 (96)	8·83 (96)	8·76 (97)

TABLE XIV

Tons Cane per Acre for Estates by Cane Class—1957 Crop

Estates	Fall plants	Spring plants	Standover spring	1st ratoons	2nd ratoons	3rd ratoons	Old cane	Average
Appleton	32·2	37·9	—	31·6	30·3	25·5	22·0	29·2
Barnett	56·0	38·9	—	34·1	32·1	25·1	24·0	29·2
Bernard Lodge	45·2	36·2	—	35·8	33·5	32·4	30·9	33·6
Caymanas	53·9	39·5	—	39·7	36·0	38·0	37·8	39·5
Frome	43·1	47·3	—	45·2	39·0	35·7	32·7	38·3
Grays Inn Central	27·8	31·0	—	30·3	27·7	31·7	28·0	29·1
Hampden	45·9	34·0	—	29·9	25·4	25·6	23·5	25·9
Holland	42·1	37·9	48·0	35·1	31·5	31·3	24·3	28·6
Innswood	—	46·8	—	40·9	38·8	33·1	32·1	34·7
Jamaica Sugar Estates	47·3	33·3	—	32·5	31·1	33·1	37·1	35·3
Long Pond	48·0	38·3	—	35·4	28·9	26·1	25·5	30·0
Monymusk	50·8	46·0	70·9	39·6	37·0	34·1	35·7	38·0
New Yarmouth	40·1	40·6	—	35·2	32·2	28·6	29·3	32·4
Richmond/Llandovery	—	34·4	—	32·5	27·3	26·6	29·7	30·4
Rose Hall	—	37·6	—	26·6	21·2	21·0	22·1	24·0
Serge Island	44·6	40·9	—	28·6	25·7	25·3	25·7	27·4
Sevens	40·3	43·9	—	34·5	37·6	32·8	30·9	35·0
United Estates	53·7	42·9	—	39·0	35·1	33·3	32·4	37·5
Vale Royal	42·6	30·7	—	31·1	27·8	25·8	23·7	25·6
Worthy Park	—	33·3	—	41·1	37·8	38·0	35·4	37·1
Average	47·8	41·5	49·8	37·8	34·3	31·4	30·9	34·3

TABLE XV

TONS CANE PER TON THEORETICAL 96° SUGAR FOR ESTATES BY CANE CLASS—1957 CROP

Estate	Fall plants	Spring plants	Standover spring	1st ratoons	2nd ratoons	3rd ratoons	Old cane	Average
Appleton	9·23	8·33	—	8·33	8·36	8·37	8·81	8·41
Barnett	8·71	7·80	—	7·89	7·76	7·87	7·96	7·90
Bernard Lodge	7·56	7·95	—	7·76	7·91	7·94	7·75	7·84
Caymanas	8·65	10·18	—	8·51	8·20	8·65	8·82	8·71
Frome	8·33	9·10	—	9·12	9·12	8·77	9·17	9·10
Gray's Inn Central	12·81	8·59	—	8·73	8·96	8·85	9·37	9·08
Hampden	7·98	8·49	—	7·95	8·11	8·17	8·02	8·12
Holland	8·79	8·45	9·15	8·22	8·22	7·91	8·37	8·32
Innswood	—	8·34	—	8·44	8·23	8·27	8·23	8·34
Jamaica Sugar Estates	8·52	8·61	—	8·20	8·17	8·20	8·89	8·60
Long Pond	9·43	9·22	—	8·91	8·81	8·66	8·74	8·87
Monymusk	8·60	10·15	9·00	9·67	9·48	9·43	9·25	9·53
New Yarmouth	8·55	10·96	—	8·61	8·63	9·04	9·12	8·95
Richmond/Llandovery	—	9·24	—	8·21	8·28	8·34	7·70	8·41
Rose Hall	—	9·46	—	8·69	8·30	8·44	8·26	8·56
Serge Island	7·66	10·79	—	7·68	7·70	7·98	8·09	7·86
Sevens	7·70	9·07	—	8·46	8·36	8·59	8·52	8·57
United Estates	8·59	7·91	—	7·74	7·68	7·85	8·44	8·01
Vale Royal	9·40	8·33	—	8·31	8·53	8·50	8·50	8·50
Worthy Park	—	8·04	—	7·31	7·16	6·89	6·82	7·05
Average	8·47	9·19	9·14	8·78	8·75	8·57	8·70	8·75

TABLE XVI

TONS THEORETICAL 96° SUGAR PER ACRE FOR ESTATES BY CANE CLASS—1957 CROP

Estates	Fall plants	Spring plants	Standover spring	1st ratoons	2nd ratoons	3rd ratoons	Old cane	Average
Appleton	3·49	4·55	—	3·79	3·63	3·05	2·50	3·47
Barnett	6·43	4·99	—	4·32	4·14	3·19	3·02	3·70
Bernard Lodge	5·97	4·55	—	4·61	4·23	4·08	3·99	4·29
Caymanas	6·23	3·88	—	4·66	4·39	4·39	4·28	4·54
Frome	5·18	5·20	—	4·95	4·28	4·07	3·57	4·21
Gray's Inn Central	2·17	3·61	—	3·47	3·09	3·58	2·99	3·20
Hampden	5·76	4·01	—	3·76	3·13	3·14	2·93	3·19
Holland	4·79	4·49	5·25	4·27	3·83	3·95	2·90	3·44
Innswood	—	5·61	—	4·84	4·71	4·00	3·90	4·16
Jamaica Sugar Estates	5·55	3·87	—	3·96	3·80	4·03	4·18	4·11
Long Pond	5·09	4·15	—	3·97	3·27	3·02	2·91	3·38
Monymusk	5·90	4·53	7·87	4·09	3·90	3·62	3·86	3·99
New Yarmouth	4·69	3·71	—	4·09	3·73	3·16	3·21	3·62
Richmond/Llandovery	—	3·72	—	3·96	3·30	3·19	3·86	3·61
Rose Hall	—	3·97	—	3·06	2·55	2·49	2·68	2·80
Serge Island	5·82	3·79	—	3·73	3·34	3·17	3·17	3·49
Sevens	5·23	4·84	—	4·08	4·50	3·82	3·63	4·08
United Estates	6·25	5·42	—	5·03	4·57	4·24	3·89	4·68
Vale Royal	4·53	3·69	—	3·74	3·26	3·04	2·79	3·01
Worthy Park	—	4·14	—	5·62	5·28	5·51	5·19	5·27
Average	5·64	4·51	5·45	4·31	3·92	3·66	3·55	3·92

TABLE XVII

PERCENTAGE ACREAGE REAPED IN EACH CANE CLASS FOR ESTATES AND ECOLOGICAL GROUPS AND AVERAGE LENGTH OF GROWTH IN MONTHS

Estates	Fall plants	Spring plants	Standover spring	1st ratoons	2nd ratoons	3rd ratoons	Old cane	Average length of growth in months
Appleton	1	15	—	23	17	32	12	11·65
Barnett	3	12	—	10	17	22	36	12·22
Frome	1	12	—	20	16	10	41	12·51
Holland	2	9	2	9	10	10	58	12·07
Wet West Estates	1	12	—	19	16	14	38	—
Hampden	1	9	—	6	18	19	47	12·69
Long Pond	5	8	—	17	15	18	37	12·20
Rose Hall	—	10	—	20	23	24	23	11·93
Vale Royal	1	2	—	10	11	21	55	11·41
Dry North Coast	12	7	—	12	16	20	43	—
Bernard Lodge	6	10	—	10	22	25	27	13·39
Caymanas	11	11	—	12	22	22	22	13·16
Innswood	—	5	—	7	7	15	66	13·87
Monymusk	2	12	—	18	31	20	17	12·69
New Yarmouth	8	6	—	21	18	23	24	12·46
Sevens	—	16	—	13	21	8	42	11·97
Irrigated Estates	4	10	—	15	25	20	26	—
Gray's Inn Central	1	15	—	10	16	11	47	12·71
Jamaica Sugar Estates	2	3	—	11	12	16	56	11·57
Richmond/Llandovery	—	26	—	16	16	20	22	11·93
Serge Island	5	5	—	24	23	16	27	11·40
Wet East Estates	2	11	—	14	16	16	41	—
United Estates	11	8	—	21	16	22	22	13·01
Worthy Park	—	8	—	15	16	26	35	12·68
Central Estates	7	8	—	19	16	23	27	—
Overall Average	3	10	—	16	20	18	33	—
Average length of growth in months	16·83	13·34	21·63	12·32	12·40	12·29	12·10	12·50

TABLE XVIII

Cwts. Theoretical 96° Sugar per Acre per Month for Estates by Cane Class

Estates	Fall plants	Spring plants	Standover spring	1st ratoons	2nd ratoons	3rd ratoons	Old cane	Average
Appleton	4·62	7·51	—	6·66	6·09	5·30	4·41	5·96
Barnett	7·16	8·08	—	7·56	6·94	5·22	4·99	6·06
Bernard Lodge	6·80	6·69	—	6·88	6·35	6·18	6·26	6·41
Caymanas	7·32	6·11	—	7·15	6·80	6·98	6·88	6·90
Frome	5·80	7·44	—	7·99	6·73	6·27	6·01	6·73
Gray's Inn Central	2·54	5·16	—	5·38	4·82	5·78	4·87	5·04
Hampden	6·60	6·34	—	5·96	5·10	4·99	4·58	5·03
Holland	6·41	7·11	4·87	7·25	6·62	6·51	5·01	5·70
Innswood	—	7·45	—	6·79	7·11	5·96	5·71	5·99
Jamaica Sugar Estates	6·20	7·11	—	6·89	6·51	7·19	7·31	7·10
Long Pond	6·18	6·47	—	7·94	6·55	5·03	4·99	5·54
Monymusk	7·12	6·49	7·00	6·53	6·31	5·89	6·17	6·29
New Yarmouth	5·77	5·87	—	6·53	6·04	5·18	5·60	5·81
Richmond/Llandovery	—	6·12	—	6·67	5·54	6·38	6·32	6·06
Rose Hall	—	5·67	—	5·21	4·43	4·28	4·54	4·70
Serge Island	6·42	6·29	—	6·69	6·00	5·69	5·89	6·13
Sevens	5·50	7·74	—	6·80	7·33	6·25	6·31	6·81
United Estates	7·63	8·84	—	8·22	7·46	6·84	5·84	7·20
Vale Royal	6·34	5·99	—	6·29	5·62	5·26	5·00	5·28
Worthy Park	—	5·84	—	9·22	8·38	8·74	8·21	8·31
Average	6·71	6·77	5·04	7·00	6·32	5·96	5·86	6·28

TABLE XIX

Distribution of Fertilizers

Acres Fertilized % Total Acres Reaped for Plants and Ratoons by Ecological Groups 1953–1957

Groups	Nitrogen		Phosphate		Potash	
	Plants	Ratoons	Plants	Ratoons	Plants	Ratoons
1953						
Wet West	99	99	43	12	94	95
North Coast	93	94	—	1	74	77
Irrigated	94	98	3	4	8	12
Wet East	92	93	24	2	25	15
Central	99	100	18	33	99	90
1954						
Wet West	98	99	56	10	87	95
North Coast	69	73	2	1	53	58
Irrigated	96	96	3	5	18	16
Wet East	83	99	45	4	28	2
Central	100	100	42	24	99	98
1955						
Wet West	96	98	41	13	94	95
North Coast	100	99	2	8	17	17
Irrigated	100	96	24	8	59	33
Wet East	100	99	1	1	77	72
Central	100	99	2	25	100	80
1956						
Wet West	98	99	28	13	97	96
North Coast	99	98	—	2	71	23
Irrigated	99	100	2	3	20	15
Wet East	88	98	11	10	51	41
Central	100	98	43	25	100	94
1957						
Wet West	91	97	22	12	86	95
North Coast	100	98	—	2	81	83
Irrigated	94	100	—	—	21	25
Wet East	95	98	1	11	50	38
Central	99	94	79	35	98	75

TABLE XX

PERCENTAGE ACREAGE FERTILIZED WITH NITROGEN FOR EACH CANE CLASS 1953–1957

Crop year	Plants		Mean	Ratoons			
	Fall	Spring		1st	2nd	3rd	Old
1953	97	94	96	97	99	98	96
1954	94	90	92	94	93	92	97
1955	97	99	98	98	99	98	98
1956	96	99	98	100	99	99	98
1957	96	94	95	99	99	99	98

TABLE XXI

AVERAGE N, P_2O_5, K_2O APPLICATIONS FOR PLANTS AND RATOONS BY ECOLOGICAL GROUPS 1953–1957

(lbs. per acre)

Groups		1953			1954			1955			1956			1957		
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Wet West	Plants	65	47	103	56	34	92	56	45	99	48	36	73	62	30	96
	Ratoons	65	22	102	61	22	101	60	31	94	49	26	82	61	28	94
North Coast	Plants	36	—	71	29	12	72	32	11	81	36	—	73	41	—	82
	Ratoons	37	22	64	31	12	58	32	12	83	32	45	70	38	20	88
Irrigated	Plants	96	15	80	99	21	74	101	19	78	105	56	89	97	—	76
	Ratoons	96	15	77	95	16	70	100	19	71	97	52	96	102	54	95
Wet East	Plants	61	39	64	75	34	68	78	21	77	68	32	76	77	33	108
	Ratoons	64	24	70	83	33	61	87	28	81	77	31	91	79	23	88
Central	Plants	67	31	90	57	38	85	72	28	87	71	32	85	56	39	88
	Ratoons	61	32	80	62	34	63	64	27	90	71	26	93	72	39	88

APPENDIX II

EXPERIMENT DATA

PART 1

RESULTS OF FERTILIZER EXPERIMENTS

A summary of the results of the fertilizer experiments reaped in 1957 is presented below. Actual yields, in tons cane per acre, % sucrose or Pol % cane and tons sugar per acre or tons pol per acre obtained by control are quoted, and yields obtained from the various levels of fertilizer are expressed as a percentage of control. The variety used in each experiment is also noted.

N.B.—The term "cut back" used in the case of certain fall plant experiments indicates that although planted in the fall of a particular year the cane was reaped the *following* crop, thus shortening the usual growing period.

(*a*) FORMAL AND DISPERSED BLOCK EXPERIMENTS

	Cwt. per acre									S.E. % g.m.	Significant difference		
	Sulphate of ammonia (N)			18% Superphosphate (P)			Muriate of potash (K)				(N)	(P)	(K)
1. Appleton—Raheen—Big Grass 3 (Dispersed Blocks 3x3x3 NPK) (B41227)	0	2	4	0	2	4	0	1	2				
Spring Plants													
Cane	38·8	95	124	40·0	108	101	37·2	101	131				
Appleton—Raheen—Big Grass 6													
Cane	35·2	119	117	39·0	92	112	36·0	108	122				
Appleton—Raheen—Big Grass 7													
Cane	30·0	116	88	34·0	86	82	29·8	114	91				
Summary:													
Cane	34·7	109	111	37·7	96	99	34·3	107	116	17·6	—	—	—
1st Ratoons													
Appleton—Raheen—Big Grass 3													
Cane	20·8	160	182	30·2	96	109	27·0	115	127				
Sucrose	14·0	102	98	14·3	97	96	14·1	100	97				
Sugar	2·9	164	178	4·3	91	106	3·9	112	120				
Appleton—Raheen—Big Grass 6													
Cane	22·8	154	167	30·3	103	113	32·1	97	101				
Sucrose	12·7	101	100	12·8	101	97	12·7	102	100				
Sugar	2·9	157	171	3·9	103	109	4·1	99	100				
Appleton—Raheen—Big Grass 7													
Cane	28·2	118	139	30·9	117	110	32·3	111	101				
Sucrose	14·0	92	94	13·7	89	99	13·6	98	95				
Sugar	3·9	109	131	4·2	110	109	4·4	108	95				
Summary:													
Cane	23·9	142	159	30·5	105	111	30·4	107	109	14·5	19·5	—	—
Sucrose	13·5	98	97	13·6	97	97	13·5	100	98	4·3	—	—	—
Sugar	3·2	140	156	4·1	101	107	4·1	107	105	12·1	16·3	—	—
2. Appleton—Raheen—Island Bottom 3 (Dispersed Blocks 3x3x3 NPK) (B41227)	0	2	4	0	2	4	0	1	2				
Spring Plants													
Cane	30·7	116	119	33·0	94	118	32·0	100	120				
Appleton—Raheen—Island Bottom 6													
Cane	31·7	108	116	31·7	113	112	34·7	98	99				
Appleton—Raheen—Island Bottom 7													
Cane	30·2	114	124	33·2	98	109	29·8	110	133				
Summary:													
Cane	30·8	113	120	32·6	102	113	32·2	102	117	9·7	10·9	10·3	10·4
1st Ratoons													
Appleton—Raheen—Island Bottom 3													
Cane	31·3	95	90	32·2	85	92	28·1	117	101				
Sucrose	14·5	101	98	14·2	103	104	14·5	98	101				
Sugar	4·5	98	89	4·5	88	97	4·1	116	102				
Appleton—Raheen—Island Bottom 6													
Cane	35·4	106	101	38·1	96	90	34·6	98	117				
Sucrose	13·3	100	101	13·2	104	100	13·4	99	100				
Sugar	4·7	106	102	5·0	98	90	4·6	98	117				
Appleton—Raheen—Island Bottom 7													
Cane	34·7	92	109	32·5	111	110	32·5	107	113				
Sucrose	14·2	102	100	14·4	97	101	14·2	101	101				
Sugar	4·9	94	110	4·7	109	111	4·6	109	115				
Summary:													
Cane	33·8	98	101	34·3	97	97	31·8	107	111	13·1	—	—	—
Sucrose	14·0	101	100	13·9	101	102	14·1	99	101	5·1	—	—	—
Sugar	4·7	100	102	4·7	100	100	4·4	107	114	6·4	6·8	—	—

	Cwt. per acre									S.E. % g.m.	Significant difference		
	Sulphate of ammonia (N)			18% superphosphate (P)			Muriate of potash (K)				(N)	(P)	(K)
3. Frome—Frome—Frome—Storer (3x3x3 NPK) (B41227)	0	1	2	0	3	6	0	1½	3				
Spring Plants													
Cane	30·4	105	101	29·7	112	101	30·1	103	105	10·4	—	—	—
Sucrose	12·5	98	98	12·7	94	97	12·4	98	100	5·2	—	—	—
Sugar	3·8	102	99	3·8	106	98	3·7	102	105	10·4	—	—	—
1st Ratoons													
Cane	46·4	103	99	48·1	96	96	45·8	102	105	6·7	—	—	—
Sucrose	13·6	95	94	13·0	102	99	12·7	104	104	3·5	—	—	—
Sugar	6·3	98	93	6·2	98	95	5·8	105	108	7·0	—	—	—
2nd Ratoons													
Cane	56·2	108	111	58·6	104	102	56·9	107	108	8·6	9·2	—	—
Sucrose	12·2	103	102	12·5	96	101	12·3	101	101	5·5	—	—	—
Sugar	6·8	111	112	7·3	100	103	7·0	107	109	8·4	9·1	—	8·9
4. Jamaica Sugar Estates—Golden Grove 13 (Dispersed Blocks 3x3x3 NPK) (B37172)	0	1	2	0	1	2	0	1	2				
Spring Plants													
Cane	27·2	130	150	36·3	94	90	34·7	101	97				
Jamaica Sugar Estates—Golden Grove 25													
Cane	26·5	143	152	36·4	90	97	34·4	106	98				
Jamaica Sugar Estates—Golden Grove 26													
Cane	27·9	142	159	36·7	105	101	39·3	90	95				
Summary:													
Cane	27·5	137	152	36·5	93	96	36·4	98	96	6·7	8·5	—	—
1st Ratoons													
Jamaica Sugar Estates—Golden Grove 13													
Cane	29·1	132	160	36·6	106	105	40·2	92	91				
Jamaica Sugar Estates—Golden Grove 25													
Cane	25·0	143	171	32·7	109	107	32·7	108	108				
Jamaica Sugar Estates—Golden Grove 26													
Cane	25·8	128	134	33·9	87	89	30·3	96	112				
Summary:													
Cane	26·6	135	155	34·4	101	101	34·5	98	102	12·8	16·7	—	—
5. Jamaica Sugar Estates—Spanish Wood 20 (Dispersed Blocks 3x3x3 NPK) (B4362)	0	1	2	0	1	2	0	1	2				
Spring Plants													
Cane	19·3	158	198	31·8	92	85	27·7	113	105				
Jamaica Sugar Estates—Spanish Wood 23													
Cane	24·1	135	151	30·7	109	94	30·9	106	95				
Jamaica Sugar Estates—Spanish Wood 29													
Cane	17·7	186	172	22·0	125	143	26·0	95	116				
Summary:													
Cane	20·4	157	172	28·2	107	104	28·2	105	105	17·1	24·5	—	—
1st Ratoons													
Jamaica Sugar Estates—Spanish Wood 20													
Cane	18·6	167	180	30·0	92	86	25·9	112	109				
Sucrose	15·8	100	97	15·6	104	98	15·8	101	97				
Sugar	3·0	165	173	4·7	94	84	4·1	111	106				
Jamaica Sugar Estates—Spanish Wood 23													
Cane	20·6	149	171	27·5	111	102	29·3	96	99				
Sucrose	16·2	94	87	15·0	101	103	15·0	102	102				
Sugar	3·3	139	150	4·1	111	106	4·3	98	101				
Jamaica Sugar Estates—Spanish Wood 29													
Cane	15·6	170	207	22·0	113	125	25·5	99	93				
Sucrose	15·7	106	99	15·7	103	103	16·2	100	97				
Sugar	2·4	182	208	3·5	116	128	4·1	98	90				
Summary:													
Cane	18·3	161	184	26·6	105	102	26·9	102	100	11·4	17·0	—	—
Sucrose	15·9	100	95	15·4	102	101	15·6	101	99	4·3	4·3	—	—
Sugar	2·9	162	176	4·1	105	102	4·2	102	98	12·4	17·9	—	—

	Cwt. per acre									S.E. % g.m.	Significant difference		
	Sulphate of ammonia (N)			18% superphosphate (P)			Muriate of potash (K)				(N)	(P)	(K)
	0	1	2	0	1	2	0	1	2				
6. Jamaica Sugar Estates—Wheelerfield 7 (Dispersed Blocks 3x3x3 NPK)													
Spring Plants													
Cane	40·3	107	117	41·6	106	107	43·3	100	101				
Jamaica Sugar Estates—Plantain Garden River 8													
Cane	32·2	117	129	38·1	98	95	37·1	98	103				
Jamaica Sugar Estates—Plantain Garden River 16													
Cane	30·7	126	142	35·6	108	108	37·7	94	105				
Summary:													
Cane	34·4	116	128	38·4	104	104	39·3	97	103	6·1	7·0	—	—
1st Ratoons													
Jamaica Sugar Estates—Wheelerfield 7													
Cane	41·2	117	122	42·7	113	114	45·5	105	102				
Sucrose	10·0	103	91	9·7	95	107	9·1	106	117				
Sugar	4·1	122	114	4·1	109	124	4·1	113	120				
Jamaica Sugar Estates—Plantain Garden River 8													
Cane	45·9	111	121	50·9	103	96	48·0	108	109				
Sucrose	12·3	100	95	12·4	100	95	12·0	98	105				
Sugar	5·7	110	113	6·3	102	90	5·7	107	115				
Jamaica Sugar Estates—Plantain Garden River 16													
Cane	30·5	149	166	41·0	108	100	40·8	107	103				
Sucrose	10·6	105	95	11·1	88	99	10·4	101	105				
Sugar	3·2	156	156	4·5	97	99	4·3	105	106				
Summary:													
Cane	39·2	123	133	44·8	108	103	44·8	107	105	7·7	9·2	—	—
Sucrose	11·0	103	94	11·0	94	100	10·5	101	108	6·3	6·3	—	6·6
Sugar	4·3	125	124	5·0	102	102	4·7	109	113	11·2	13·0	—	11·9
7. Long Pond—Etingdon—Grass Hill Bottom (3x3x3 NPK) (Co421)													
	0	2	4	0	2	4	0	1	2				
Fall Plants													
Cane	44·1	102	107	45·3	104	97	41·7	114	112	12·1	—	—	—
Sucrose	12·0	96	101	11·6	102	104	12·0	100	97	7·0	—	—	—
Sugar	5·3	99	108	5·3	106	100	5·0	114	109	11·9	—	—	—
1st Ratoons													
Cane	31·3	127	139	35·8	115	105	37·5	104	102	21·6	26·5	—	—
Sucrose	10·5	98	101	10·5	99	101	10·3	102	102	8·6	—	—	—
Sugar	3·3	124	141	3·8	113	106	3·9	106	105	24·0	29·3	—	—
8. Richmond/Llandovery—Llandovery—Well Piece 3 (3x3x3 NPK) B(4362)													
	0	2	4	0	2	4	0	1	2				
Spring Plants													
Cane	46·8	99	108	47·8	99	102	46·9	100	107	7·1	7·3	—	—
Sucrose	9·2	83	100	8·1	116	107	9·2	92	92	14·5	13·8	—	—
Sugar	4·3	82	108	3·9	113	109	4·3	92	99	16·5	16·0	—	—
1st Ratoons													
Cane	49·5	97	110	50·8	102	97	50·7	101	98	9·7	10·0	—	—
Sucrose	13·0	93	88	11·4	109	111	11·9	95	112	15·7	—	—	—
Sugar	6·4	91	97	5·8	110	106	6·0	97	109	15·0	—	—	—
2nd Ratoons													
Cane	41·6	112	115	43·9	104	106	44·1	107	102	11·1	12·2	—	—
Sucrose	13·1	93	94	11·9	108	107	12·2	101	106	8·8	—	—	—
Sugar	5·4	104	108	5·2	113	113	5·3	110	110	11·6	—	—	—
9. Richmond/Llandovery—Richmond—Cove 2 (3x3x3 NPK) (B4362)													
	0	2	4	0	2	4	0	1	2				
Spring Plants													
Cane	34·5	110	118	38·8	95	97	37·7	104	97	12·0	13·1	—	—
Sucrose	11·6	98	92	10·7	101	113	12·1	90	89	17·2	—	—	—
Sugar	4·1	105	107	4·2	97	110	4·6	94	85	26·4	—	—	—
				Not reaped as 1st Ratoons									
2nd Ratoons													
Cane	36·0	105	98	36·3	98	103	34·7	108	107	8·3	—	—	—
Sucrose	15·0	102	104	15·0	103	103	15·4	99	99	9·3	—	—	—
Sugar	5·4	108	102	5·4	101	107	5·3	108	106	12·2	—	—	—

	Cwt. per acre									S.E. % g.m.	Significant difference		
	Sulphate of ammonia (N)			18% superphosphate (P)			Muriate of potash (K)				(N)	(P)	(K)
10. Richmond/Llandovery—Richmond—Garden Piece (Dispersed Blocks 3x3x3 NPK) (B4362)	0	2	4	0	2	4	0	1	2				
Spring Plants													
Cane	40·7	103	107	41·7	102	101	41·3	106	99				
Sucrose	12·6	97	102	11·9	109	109	12·1	105	108				
Sugar	5·0	100	106	4·8	114	113	4·7	108	107				
Richmond/Llandovery—Richmond—Lime Kiln 3 (B41227)													
Cane	43·5	100	105	41·4	107	113	45·4	94	94				
Sucrose	10·2	108	117	11·0	103	98	11·1	100	97				
Sugar	4·2	108	123	4·6	110	110	5·1	96	93				
Richmond/Llandovery—Llandovery—Upper Pond (B41227)													
Cane	47·2	98	115	49·0	98	104	48·3	110	97				
Sucrose	12·3	102	103	12·9	91	92	11·3	112	110				
Sugar	5·6	101	119	6·3	90	95	5·5	122	106				
Summary:													
Cane	43·8	100	107	44·0	102	106	45·0	104	95	7·9	8·1	—	—
Sucrose	11·6	102	107	11·9	101	99	11·5	106	105	8·0	—	—	—
Sugar	5·1	103	117	5·3	102	104	5·2	110	102	9·8	11·0	—	—
1st Ratoons													
Richmond/Llandovery—Richmond—Garden Piece													
Cane	44·4	103	97	41·4	107	115	46·4	93	95				
Sucrose	12·2	97	108	12·2	102	104	12·5	96	103				
Sugar	5·5	100	98	5·0	110	120	5·8	89	97				
Richmond/Llandovery—Richmond—Lime Kiln 3													
Cane	38·2	126	111	38·7	112	121	42·8	109	92				
Sucrose	12·1	106	99	12·6	94	100	12·2	101	102				
Sugar	4·6	133	110	4·9	106	121	5·3	108	94				
Richmond/Llandovery—Llandovery—Upper Pond													
Cane	29·5	124	108	32·4	101	102	34·8	92	90				
Sucrose	15·2	102	101	15·2	103	102	15·3	101	101				
Sugar	4·5	127	110	4·9	104	104	5·3	93	91				
Summary:													
Cane	37·4	117	105	37·5	107	113	41·3	98	93	9·0	9·7	9·7	—
Sucrose	13·2	102	103	13·3	100	102	13·3	99	102	5·1	—	—	—
Sugar	4·9	119	108	4·9	106	115	5·5	96	94	11·1	12·1	—	—
11. Rose Hall—Calabash II (3x3x3 NPK) (B41227)	0	2	4	0	2	4	0	1	2				
Spring Plants													
Cane	44·6	100	117	46·8	100	101	47·0	97	104	3·9	4·2	—	4·0
1st Ratoons													
Cane	43·1	99	113	44·0	102	103	44·1	100	104	8·3	8·7	—	—
Pol % cane	19·3	97	95	17·8	108	108	19·1	98	96	8·2	—	—	—
Pol	8·3	96	100	7·8	109	106	8·0	104	105	12·1	—	—	—
2nd Ratoons													
Cane	29·7	100	97	27·7	102	117	26·8	105	124	12·8	—	13·6	14·1
Sucrose	16·3	101	97	15·8	104	103	16·3	102	96	6·2	—	—	—
Sugar	4·8	101	95	4·3	107	121	4·4	105	121	11·0	—	12·1	12·0
12. Rose Hall—Orange Valley—Still House (3x3x3 NPK) (B41227)	0	2	4	0	2	4	0	1	2				
Fall Plants													
Cane	49·2	100	97	45·0	110	117	48·7	94	107	10·6	—	11·7	10·8
Sucrose	13·5	92	95	12·8	105	98	12·0	114	108	24·8	—	—	—
Sugar	6·6	93	96	5·6	121	119	5·9	103	116	27·7	—	—	—
13. Serge Island—Hall Head—Gutter Piece (3x3x3 NPK) (B3439)	0	3	6	0	4	8	0	1	2				
Spring Plants													
Cane	23·6	107	99	24·5	102	92	23·2	100	111	22·1	—	—	—
Sucrose	13·2	98	96	12·9	99	102	12·6	102	108	5·3	—	—	5·5
Sugar	3·1	104	95	3·2	101	93	2·9	102	119	23·9	—	—	—
1st Ratoons													
Cane	20·2	115	142	22·9	106	109	22·8	111	105	17·1	20·4	—	—
				Not reaped as 2nd Ratoons									
3rd Ratoons													
Cane	42·7	105	111	43·7	101	108	43·8	107	102	8·6	9·1	—	—
Sucrose	15·0	100	97	14·9	101	100	15·1	95	101	7·7	—	—	—
Sugar	6·4	105	107	6·5	102	108	6·6	102	103	11·9	—	—	—

	Cwt. per acre									S.E. % g.m.	Significant difference		
	Sulphate of ammonia (N)			18% superphosphate (P)			Muriate of potash (K)				(N)	(P)	(K)
14. United Estates—Angels—Roberts I (Dispersed Blocks 3x3x3 NPK) (B4362) (**Not reaped as plants**)													
	0	2	4	0	2	4	0	1	2				
1st Ratoons													
Cane	27·5	109	115	30·3	96	99	26·6	114	122				
Sucrose	13·9	92	93	12·8	104	104	13·1	101	102				
Sugar	3·8	102	107	3·9	98	102	3·4	116	124				
United Estates—Angels—Roberts II													
Cane	23·1	112	118	21·4	141	116	20·9	129	139				
Sucrose	12·9	96	111	12·9	102	105	12·2	109	116				
Sugar	3·0	108	133	2·8	145	122	2·5	138	161				
United Estates—Angels—Roberts III													
Cane	28·9	105	122	31·2	105	97	31·5	100	99				
Sucrose	12·3	101	99	12·1	107	99	12·5	97	99				
Sugar	3·6	106	121	3·8	111	96	3·9	98	97				
Summary:													
Cane	26·5	109	118	27·6	111	103	26·3	112	117	12·7	13·9	—	13·9
Sucrose	13·0	96	101	12·6	104	103	12·6	102	105	8·2	—	—	—
Sugar	3·4	105	119	3·5	116	105	3·3	115	124	13·8	14·9	—	15·6

(i) TYPES OF NITROGEN

1. Appleton—Appleton—Sampson Gate II (Sulphate of ammonia vs. Urea) (B41227)

	Sulphate of ammonia			Urea			
	0	1½	3	0·68	1·36	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	26·1	114	125	109	125	7·4	11·7
Sucrose	12·2	102	100	100	101	3·2	—
Sugar	3·2	116	126	109	127	8·0	16·4

2. Appleton—Raheen—Negro House 3 (Sulphate of ammonia vs. Urea) (B41227)

	Sulphate of ammonia			Urea			
	0	1½	3	0·68	1·36	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	39·6	111	114	110	110	5·1	7·6
Sucrose	14·8	106	98	98	109	5·1	7·2
Sugar	5·9	118	112	108	120	5·5	8·5

3. Appleton—Raheen—Turner Piece 3 (Sulphate of ammonia vs. Urea) (B41227)

	Sulphate of ammonia			Urea			
	0	1½	3	0·68	1·36	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	37·0	113	109	100	104	10·3	—
Sucrose	13·7	101	101	98	99	4·1	—
Sugar	5·1	114	109	98	104	10·4	—

4. Appleton—Appleton—Bailey Piece (Nitrogen vs. Urea)

	Control	Sulphate of ammonia	Nitrate of soda	Urea		
	0	1½	1·95	0·69	S.E. % g.m.	Significant difference
3rd Ratoons						
Cane..	38·8	111	104	106	9·5	—
Sucrose	11·4	96	97	99	6·2	—
Sugar	4·4	107	101	105	10·8	—

5. Appleton—Appleton—Salmon Piece (Nitrogen vs. Urea)

	Control	Sulphate of ammonia	Nitrate of soda	Urea		
	0	1½	1·95	0·69	S.E. % g.m.	Significant difference
3rd Ratoons						
Cane..	40·2	98	100	105	7·2	—
Sucrose	12·9	95	98	98	4·5	—
Sugar	5·2	93	97	103	5·1	—

6. Barnett—Bogue—Hardtime 3 (Sulphate of ammonia vs. Urea) (B41227)

	Sulphate of ammonia			Urea			
	0	2	4	0·9	1·8	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	36·4	95	95	104	103	6·6	—
Sucrose	11·6	104	112	112	100	7·2	10·4
Sugar	4·2	98	108	116	104	10·9	—

7. Barnett—Catherine Mt.—Boiling House (Sulphate of ammonia vs. Urea) (B4362)

	Sulphate of ammonia			Urea			
	0	2	4	0·9	1·8	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	33·1	98	101	94	99	5·7	—
Sucrose	13·0	100	96	101	102	6·9	—
Sugar	4·3	97	97	94	101	6·0	—

8. Bernard Lodge—Phoenix Park—Section 7b (Sulphate of ammonia vs. Urea (B42231)

	Sulphate of ammonia			Urea (lbs. per acre)			
	0	2½	5	128	256	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	42·2	116	129	112	109	8·3	12·9
Sucrose	11·8	102	98	95	99	7·4	—
Sugar	5·0	117	126	106	109	14·0	—

9. Jamaica Sugar Estates—Golden Grove—Section 17 (Sulphate of ammonia vs. Urea) (B37172)

	Sulphate of ammonia			Urea			
	0	2	4	1	2	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	30·5	140	124	120	111	6·1	10·0

10. Monymusk—Exeter—Section 65 (Sulphate of ammonia vs. Urea) (B41227)

	Sulphate of ammonia			Urea			
	0	3	6	1½	3	S.E. % g.m.	Significant difference
Spring Plants							
Cane..	75·9	102	103	99	109	9·3	—
Sucrose	9·6	97	98	91	92	11·6	—
Sugar	7·3	97	99	89	99	10·5	—

11. Richmond/Llandovery—Llandovery—Alligator Hole (N-source/placement) (B41227)

Spring Plants	Control	Sulphate of ammonia 2 cwt. per acre	Nitrate of soda 2·62 cwt per acre	Urea 0·91 cwt. per acre	Ammophos 1 cwt. + 1·12 cwt. S/A per acre	S.E. % g.m.	Significant difference
Cane Surface	35·8	143	133	137	103	19·1	—
Cane Buried		123	135	124	101		
Sucrose Surface	11·1	97	96	106	103	6·4	9·5
Sucrose Buried		109	95	101	111		
Sugar Surface	4·0	137	128	144	106	16·6	—
Sugar Buried		133	128	123	112		

12. Sevens—Parnassus—Johnson 4 (Sulphate of ammonia vs. Urea)

Spring Plants	Sulphate of ammonia 0	Sulphate of ammonia 2	Sulphate of ammonia 4	Urea 1	Urea 2	S.E. % g.m.	Significant difference
Cane	20·6	152	140	134	146	9·9	20·4
Sucrose	14·4	101	99	99	102	3·3	—
Sugar	2·4	154	140	135	150	10·9	28·4

(ii) ARTIFICIAL AND ORGANIC AND LIMING EXPERIMENTS

1. Barnett—Dispersed Block (Superphosphate vs. Filter press mud)

	Control	Superphosphate	Filter press mud	S.E. % g.m.	Significant difference
Barnett—Bottom McLaughlin					
Cane	21·5	97	123		
Sucrose	12·8	91	97		
Sugar	2·7	88	120		
Barnett—Pye River—No. 3					
Cane	52·0	78	106		
Sucrose	12·0	108	103		
Sugar	6·2	84	109		
Barnett—Road Piece—No. 5					
Cane	15·5	106	93		
Sucrose	13·2	121	117		
Sugar	2·1	127	108		
Barnett—Top Curtiss					
Cane	19·7	85	89		
Sucrose	8·6	149	142		
Sugar	1·7	127	127		
Summary					
Cane	27·2	87	104	15·1	—
Sucrose	11·6	115	113	9·7	—
Sugar	3·2	97	114	14·2	—

2. Frome—Belle Isle—Meylersfield—Lime Kiln—(Bagasse, knifing and nitrogen) (B41227)

	Tons per acre bagasse 0	10	20	30	Knifing 0	1	Cwt. per acre Sulphate of ammonia 3	6	S.E. % g.m. A	B	Significant difference B	K	N
Fall Plants													
Cane	38·1	91	90	82	30·9	124	31·7	118	15·5	10·2	—	10·8	6·8
Sucrose	13·9	98	101	100	14·0	99	14·0	99	3·9	2·8	—	—	—
Sugar	5·3	90	91	82	4·3	122	4·4	116	13·1	3·6	10·4	9·0	2·5
1st Ratoons													
Cane	43·0	100	103	100	42·7	103	41·0	112	6·9	6·5	—	—	4·4
Sucrose	13·5	100	100	100	13·4	101	13·7	98	3·3	3·9	—	—	2·4
Sugar	5·8	100	103	100	5·7	105	5·6	109	6·4	5·7	—	3·7	4·1
2nd Ratoons													
Cane	40·2	100	103	99	39·1	107	39·4	105	10·5	9·9	—	6·7	—
Sucrose	13·9	98	101	100	14·0	99	14·0	99	3·9	2·8	—	—	—
Sugar	5·6	98	104	98	5·6	102	5·4	108	11·4	11·0	—	—	7·0

3. Frome—Masemure—Albany—Cotton Tree (Liming, bagasse, N, knifing, cross knifing) (B41227)

	Tons per acre bagasse 0	15	30	Knifing 1	2	Cwt. per acre Sulphate of ammonia 3	6	Liming 0	1	S.E. % g.m. B	K	N	Significant difference B	K	N	L
Spring Plants																
Cane	40·8	95	90	39·5	96	37·2	108	37·7	100	7·6	8·2	9·2	6·8	—	5·1	—
Sucrose	12·4	98	96	13·1	101	12·1	101	12·4	99	7·6	6·8	5·3	—	—	—	—
Sugar	5·1	92	87	4·8	97	4·5	110	4·7	99	11·5	12·8	9·9	10·1	—	5·5	—
1st Ratoons																
Cane	56·0	99	98	56·8	95	54·6	103	54·2	99	10·5	6·6	9·4	—	4·6	—	—
Sucrose	11·9	91	93	11·2	100	11·2	101	11·5	96	9·0	4·3	9·9	9·0	—	—	—
Sugar	6·7	90	91	6·4	95	6·1	103	6·3	95	12·2	5·6	12·8	10·8	3·9	—	—

4. Frome—Masemure—Albany—Old Town (Liming, bagasse, N, knifing, cross knifing) (B41227)

	Tons per acre bagasse 0	15	30	Knifing 1	2	Cwt. per acre Sulphate of ammonia 3	6	Liming 0	1	S.E. % g.m. B	K	N	Significant difference B	K	N
Spring Plants															
Cane	36·9	97	89	34·2	106	34·1	106	36·1	97	15·3	8·8	10·5	9·3	—	—
Sucrose	11·7	104	103	12·1	98	11·9	103	12·1	100	6·0	7·0	5·5	—	—	—
Sugar	4·4	101	91	4·2	104	4·1	108	4·4	98	15·7	13·5	12·7	—	—	—
1st Ratoons															
Cane	54·0	102	100	54·2	100	52·0	109	54·7	99	5·4	8·3	9·0	—	—	5·0
Sucrose	11·8	100	103	12·0	100	12·1	97	11·8	102	6·7	2·1	6·4	—	—	—
Sugar	6·4	101	103	6·5	99	6·3	106	6·5	101	8·4	8·2	11·2	—	—	—

5. Innswood—St. Helen's—Section 9c (B41227)

	Tons bagasse per acre				S.E. % g.m.	Significant difference
	0	10	20	30		
Standover Spring						
Cane..	71·7	105	101	96	10·3	—
Sucrose	10·1	106	100	98	9·4	—
Sugar	7·3	110	101	94	15·1	—
1st Ratoons						
Cane..	50·8	107	102	97	5·5	—
Sucrose	12·3	95	96	97	6·3	—
Sugar	6·3	101	99	95	10·3	—

6. Sevens—Parnassus—Section 90a (Liming)

	0	10	20	S.E. % g.m.	Significant difference
Spring Plants					
Cane..	54·0	113	95	11·0	—
Sucrose	10·0	98	104	5·4	—
Sugar	5·4	111	98	14·5	—

Lime applied at 10 and 20 tons marl per acre

(iii) OTHER MATERIALS

FLOTAL

1. United Estates—Whitewater 5 (B41227)

	No flotal	10 cwt. flotal per acre
Spring Plants		
Cane..	47·2	104
Sucrose	12·7	100
Sugar	6·0	104
1st Ratoons		
Cane..	49·9	101
Sucrose	12·0	99
Sugar	6·0	100

PART 2
VARIETY X FERTILIZER EXPERIMENT

1. Frome—Masemure—Long Corner (Variety x N x K)

Cane

Variety	Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
Fall Plants											
B37161	52·7	95	95	47·6	114	107	50·9	0	69·0	103	104
B41227	112	111	124	123	124	136	120	1	97	104	110
B42231	89	94	101	108	100	107	98	2	106	103	108
B4362	96	104	103	113	113	109	104				
Mean	52·3	103	106	52·9	102	103					
S.E. % g.m. ..				7·2							
	Variety			N			K				
Sig. Diff.	8·0			—			—				

Sucrose

Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
11·4	106	114	11·3	114	109	12·2	0	9·6	98	105
112	105	105	109	114	102	100	1	109	96	109
121	121	117	126	118	119	112	2	96	109	95
125	121	126	126	128	122	116	—	—	—	—
13·0	99	101	12·9	103	99			—	—	—
S.E. % g.m. ..			6·1							
			Variety		N		K			
Sig. Diff. ..			6·0		—		—			

Sugar

Variety	Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
Fall Plants											
B37161	6·1	101	107	5·4	129	117	6·2	0	9·0	100	107
B41227	124	117	130	135	143	140	121	1	104	97	119
B42231	107	114	117	136	117	127	110	2	99	110	100
B4362	119	125	129	141	145	133	121				
Mean	6·8	101	107	6·9	104	101					
S.E. % g.m.				6·2							
				Variety		N		K			
Sig. Diff.				7·3		5·8		—			

Cane

Variety	Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
1st Ratoons											
B41227	28·3	125	116	28·0	126	117	32·1	0	38·8	132	134
B42231	129	150	165	138	154	157	131	1	113	147	130
B4362	111	132	140	132	125	130	113	2	126	131	155
Mean	125	155	153	136	135	166	127	—	—	—	—
S.E. % g.m. ..	32·8	121	124	35·4	107	112	—				
				8·7							
Sig. Diff.	Variety			N			K				
	8·7			7·3			6·8				

Sucrose

Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
13·4	93	96	12·1	108	111	12·8	0	9·9	99	97
98	95	99	109	106	108	102	1	101	95	102
98	100	101	111	107	112	104	2	100	99	100
100	99	96	110	110	104	103	—	—	—	—
13·2	97	99	13·0	101	101	—				
S.E. % g.m. ..			2·9							
			Variety		N		K			
Sig. Diff. ..			1·4		1·2		—			

Sugar

Variety	Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
1st Ratoons											
B37161	3·8	114	111	3·3	137	131	4·1	0	5·1	132	131
B41227	125	142	163	152	165	170	132	1	115	140	132
B42231	108	131	141	148	136	148	117	2	125	130	155
B4362	123	153	145	152	152	175	130	—	—	—	—
Mean	4·3	118	123	4·6	107	113	—				
S.E. % g.m.				10·4							
				Variety		N		K			
Sig. Diff.				9·5		7·8		7·3			

Cane

Variety	Cwt. per acre sulphate of ammonia 0	3	6	cwt. per acre muriate of potash 0	1	2	Mean	cwt. per acre sulphate of ammonia M/P	0	3	6
2nd Ratoons											
B37161	32·3	122	105	28·1	144	130	35·0	0	30·2	137	133
B41227	118	137	131	129	150	164	118	1	124	174	127
B42231	109	134	148	151	147	151	120	2	143	131	164
B4362	131	160	146	150	168	184	134	—	—	—	—
Mean	36·9	121	116	37·2	115	119	—				
S.E. % g.m. ..				9·1							
	Variety			N			K				
Sig. Diff.	11·1			9·1			9·0				

Sucrose

cwt. per acre sulphate of ammonia 0	3	6	cwt. per acre muriate of potash 0	1	2	Mean	cwt. per acre sulphate of ammonia M/P	0	3	6
12·1	82	82	12·5	115	127	10·6	0	11·9	91	89
98	91	92	123	118	120	106	1	100	89	99
93	96	92	125	122	117	107	2	97	99	92
99	98	103	129	134	125	115	—	—	—	—
11·8	94	94	11·0	103	103	—				
S.E. % g.m. ..			10·2							
			Variety		N		K			
Sig. Diff. ..			—		—		—			

Sugar

Variety	Cwt. per acre sulphate of ammonia 0	3	6	Cwt. per acre muriate of potash 0	1	2	Mean	Cwt. per acre sulphate of ammonia M/P	0	3	6
2nd Ratoons											
B37161	3·9	101	91	2·6	164	164	3·8	0	4·8	127	128
B41227	115	125	120	158	175	195	123	1	124	158	127
B42231	103	129	137	188	178	175	126	2	140	131	150
B4362	132	158	152	177	224	229	152	—	—	—	—
Mean	4·4	114	111	4·2	115	119	—				
S.E. % g.m. ..				11·3							
				Variety		N		K			
Sig. Diff.				17·3		—		13·3			

PART 3

RESULTS OF VARIETY EXPERIMENTS

A summary of the results of the variety experiments reaped in 1957 is presented below. Actual yields in tons cane per acre, % sucrose (or pol % cane*) and tons sugar per acre (or tons pol per acre*) obtained by the standard variety, are quoted, and the yields obtained from the other varieties are expressed as a percentage of the standard.

(*a*) COMPARISON OF COMMERCIAL VARIETIES

HIGH RAINFALL AREAS

Variety	Cane				Pol % Cane* or Sucrose				Pol* or Sugar			
	P.	1st R.	2nd R.	3rd R.	P.	1st R.	2nd R.	3rd R.	P.	1st R.	2nd R.	3rd R.
1. Frome—Belle Isle—Meylersfield—Butchers Clump (spring planted 1955)												
B37161 ..	21·4	31·4			13·4	12·2			2·9	3·8		
B41227 ..	125	128			106	109			133	140		
B42231 ..	114	109			98	111			111	122		
B4362 ..	130	117			100	117			131	137		
S.E. % g.m. ..	4·4	13·1			5·1	3·0			8·6	12·3		
Sig. Diff. ..	9·0	—			—	4·8			17·7	26·5		
2. Frome—Shrewsbury—Shrewsbury—Top Cabbage (spring planted 1955)												
B37161 ..	30·5	34·3			13·9	12·8			4·2	4·4		
B41227 ..	113	121			89	99			100	120		
B42231 ..	89	104			105	103			93	108		
B4362 ..	118	109			108	113			128	122		
S.E. % g.m. ..	6·3	7·8			3·1	5·3			7·1	8·8		
Sig. Diff. ..	11·5	14·6			5·4	—			13·0	—		
3. Serge Island—Pasture Piece (spring planted 1954)												
B37172 ..	35·9	37·2	28·2		—	15·1	15·8		—	5·6	4·4	
B4362 ..	104	95	95		—	111	103		—	106	98	
S.E. % g.m. ..	8·7	12·6	10·2		—	5·9	7·1		—	12·6	12·2	
Sig. Diff. ..	—	—	—		—	4·4	—		—	—	—	

DRY NORTH COAST AREA

4. Barnett—Fairfield—Gold Course (spring planted 1954)												
B37161 ..	32·9	26·0	22·7		13·4	12·7	14·1		4·4	3·3	3·2	
B41227 ..	136	135	145		94	89	96		129	121	139	
B4362 ..	137	146	119		101	98	96		140	143	114	
B47361 ..	129	119	84		88	88	96		111	104	81	
S.E. % g.m. ..	6·9	11·5	17·3		5·4	5·5	5·9		9·1	9·8	17·3	
Sig. Diff. ..	14·9	24·8	32·5		8·9	8·9	—		19·0	19·9	32·5	
5. Long Pond—Long Pond—Brown Piece (fall planted 1954)												
B42231 ..	95	84			117	96			111	81		
B49396 ..	80	83			103	104			83	86		
BJ235 (B52405)	96	99			97	94			94	93		
BJ443 (B52408)	97	89			87	76			84	68		
Co331 ..	48·8	44·1			8·1	11·9			3·9	5·2		
Co421 ..	82	84			98	89			80	75		
S.E. % g.m. ..	9·6	9·2			13·6	8·7			17·6	10·8		
Sig. Diff. ..	12·6	10·9			—	10·6			19·7	12·0		
6. Long Pond—Long Pond—Old House (fall planted 1954)												
B37161 ..	35·5	26·6			10·8	11·0			3·1	2·9		
B37172 ..	112	102			104	109			116	113		
B42231 ..	93	84			117	118			109	101		
B49198 ..	134	126			79	106			105	134		
BJ64 (B52402)	60	71			96	106			59	75		
May336 ..	66	79			121	127			80	101		
S.E. % g.m. ..	11·1	14·9			9·7	8·0			13·6	20·5		
Sig. Diff. ..	13·9	18·3			13·1	11·7			16·9	28·0		

Variety	Cane				Pol % Cane* or Sucrose				Pol* or Sugar			
	P.	1st R.	2nd R.	3rd R.	P.	1st R.	2nd R.	3rd R.	P.	1st R.	2nd R.	3rd R.
7. Rose Hall—Calabash II (spring planted 1954)												
B3439 ..	24·6	22·6	16·7		—	19·4	15·3		—	4·4	2·6	
B37161 ..	100	115	116		—	98	103		—	112	119	
B41227 ..	142	175	166		—	102	105		—	175	175	
B4362 ..	121	153	138		—	115	110		—	175	152	
Co331 ..	126	162	153		—	95	98		—	151	150	
Co421 ..	131	136	121		—	95	101		—	129	123	
S.E. % g.m. ..	12·1	16·7	8·6		—	11·5	4·5		—	18·2	10·5	
Sig. Diff. ..	17·4	30·9	13·7		—	—	5·6		—	33·6	17·1	

(*b*) VARIETY SELECTION EXPERIMENTS

(i) FINAL STAGE TRIALS. "FIRST 500" SEEDLINGS (= B51400 SERIES) AND THE B47' SERIES

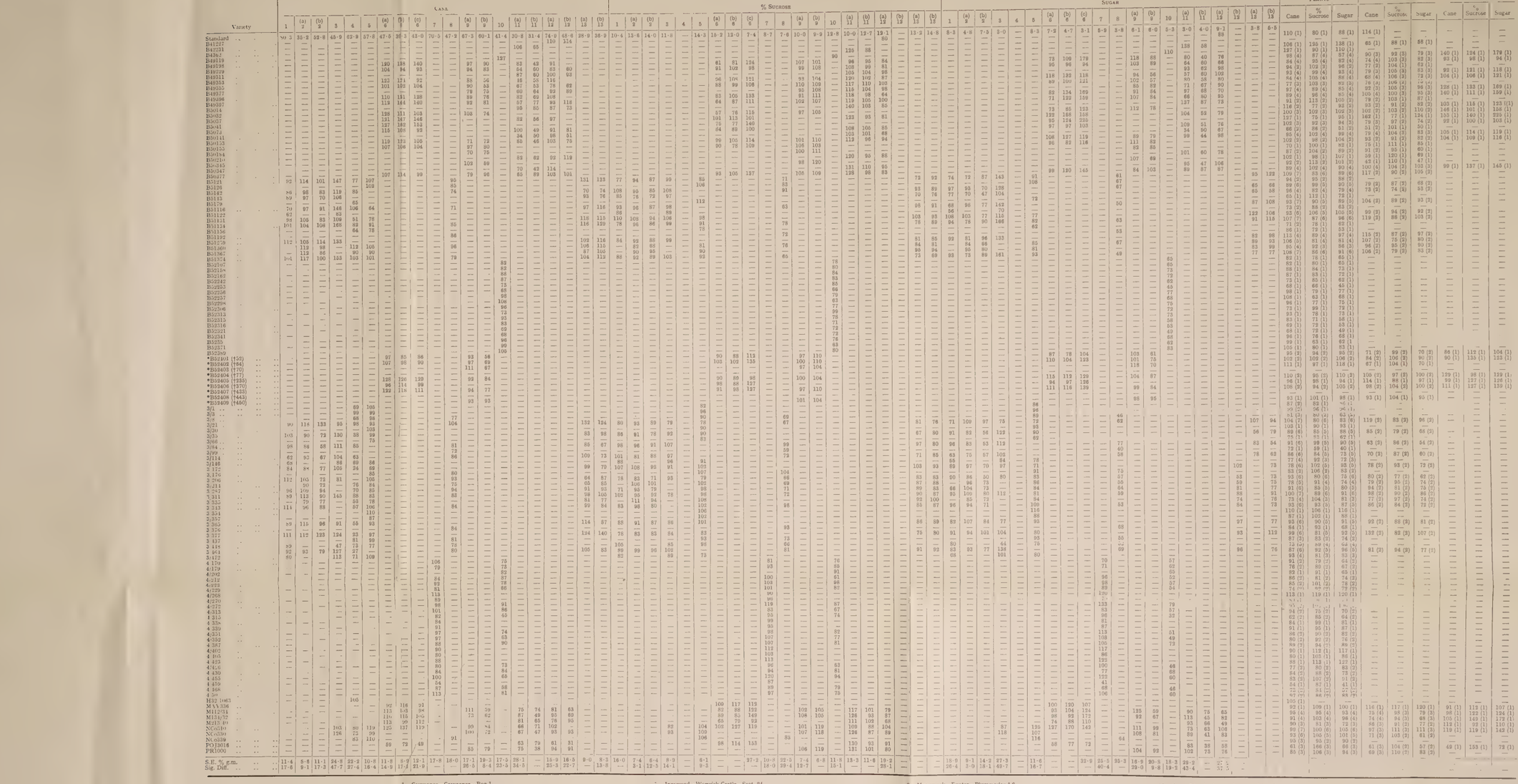
(INCOMPLETE BLOCK)

NOTE.—Actual yields are quoted for the standard variety, with the yields of the other varieties expressed as a percentage of the standard.

Variety	Cane	% Sucrose	Sugar	Average: Plants 1st Ratoons Cane	Plants 1st Ratoons % Sucrose	Plants 1st Ratoons Sugar	Average: 2nd Ratoons Cane	2nd Ratoons % Sucrose	2nd Ratoons Sugar
Standard	29·4 31·5 37·6 21·9 61·2 84·9 29·4 49·6 41·4 43·7 49·1 56·3 33·5 19·0 49·8 53·5	73·2 34·4 14·5 30·7 43·8 62·6 52·9 44·0 52·7 35·2 37·6 94·8 97·0 26·3 35·6 36·5	33·4 25·7 15·8 15·2 13·7 12·6 10·3 12·0 13·1 12·1 14·0 15·1 14·9 9·9 12·6 10·4	10·6 8·1 10·8 10·0 7·2 8·8 13·5 14·5 12·0 10·6 13·1 11·8 13·4 10·6 13·3	4·7 4·7 5·2 9·7 5·4 10·3 5·1 6·5 5·0 6·1 7·7 8·4 8·9	1·8 4·8 6·0 7·7 1·8 1·8 3·1 4·6 2·8 4·7 5·1 2·9 2·8 3·5 4·9 5·4 3·8 2·4	— — —	— — —	— — —
B3459	— — —

(ii) FIRST STAGE LATTICE EXPERIMENTS. "SECOND 500" SEEDLINGS

NOTE.—Actual yields are quoted for the standard variety, with the yields of the other varieties expressed as a percentage of the standard.



Variety	Cane	% Sucrose	Sugar	Average Plants	Average 1st Ratoons	Average 2nd Ratoons
				Cane / % Sucrose / Sugar	Cane / % Sucrose / Sugar	Cane / % Sucrose / Sugar
Standard	90·3	35·2	31·8	110 (1)	80 (1)	88 (1)	114 (1)	—	—	—	—	—
B41227	—	—	—	106 (1)	125 (1)	133 (1)	85 (1)	88 (1)	88 (1)	—	—	—
B42231	—	—	—	197 (1)	90 (1)	110 (1)	—	—	—	—	—	—
B43/62	—	—	—	93 (4)	87 (4)	87 (4)	90 (3)	92 (3)	79 (3)	140 (1)	124 (1)	173 (1)
B49119	—	—	—	84 (4)	95 (4)	82 (4)	74 (4)	103 (3)	82 (3)	93 (1)	98 (1)	94 (1)
B49195	—	—	—	94 (3)	102 (3)	96 (2)	71 (2)	104 (1)	73 (2)	—	—	—
B49229	—	—	—	93 (4)	99 (4)	93 (4)	79 (2)	105 (3)	83 (3)	92 (1)	121 (1)	113 (1)
B49311	—	—	—	84 (4)	105 (4)	88 (4)	68 (4)	106 (3)	72 (3)	104 (1)	106 (1)	121 (1)
B49353	—	—	—	77 (3)	103 (3)	82 (3)	76 (3)	106 (2)	81 (2)	—	—	—
B49355	—	—	—	97 (4)	89 (4)	85 (4)	92 (3)	105 (3)	96 (3)	122 (1)	133 (1)	169 (1)
B49377	—	—	—	96 (4)	96 (4)	92 (4)	105 (3)	105 (3)	99 (3)	140 (1)	111 (1)	159 (1)
B49396	—	—	—	91 (2)	113 (2)	105 (2)	79 (2)	103 (1)	81 (2)	—	—	—
B49397	—	—	—	116 (2)	97 (2)	92 (2)	91 (2)	91 (2)	82 (2)	103 (1)	116 (1)	123 (1)
B5014	—	—	—	100 (3)	109 (3)	102 (3)	102 (2)	103 (2)	110 (2)	146 (1)	101 (1)	156 (1)
B5032	—	—	—	137 (1)	75 (1)	95 (1)	162 (1)	77 (1)	124 (1)	153 (1)	140 (1)	223 (1)
B5037	—	—	—	103 (2)	92 (2)	94 (2)	73 (2)	97 (2)	74 (2)	92 (1)	100 (1)	105 (1)
B5041	—	—	—	86 (2)	98 (2)	91 (2)	51 (2)	101 (1)	50 (1)	—	—	—
B5072	—	—	—	93 (4)	103 (4)	99 (4)	78 (4)	104 (3)	83 (3)	105 (1)	114 (1)	119 (1)
B50141	—	—	—	109 (2)	98 (2)	104 (2)	93 (2)	91 (2)	85 (2)	104 (1)	109 (1)	116 (1)
B50153	—	—	—	73 (1)	100 (1)	93 (1)	68 (1)	111 (1)	76 (1)	—	—	—
B50155	—	—	—	87 (2)	104 (2)	89 (2)	91 (2)	95 (1)	86 (1)	—	—	—
B50184	—	—	—	102 (1)	98 (1)	107 (1)	59 (1)	120 (1)	69 (1)	—	—	—
B50210	—	—	—	92 (2)	113 (2)	103 (2)	63 (1)	110 (1)	67 (1)	—	—	—
B50345	—	—	—	89 (4)	102 (4)	90 (4)	100 (4)	104 (3)	103 (3)	99 (1)	157 (1)	145 (1)
B50347	—	—	—	107 (4)	103 (4)	93 (4)	117 (3)	90 (3)	109 (3)	—	—	—
B50377	—	—	—	94 (2)	95 (2)	88 (2)	55	122	109 (1)	—	—	—
B5121	—	—	—	89 (4)	99 (3)	92 (3)	79 (2)	87 (2)	68 (2)	—	—	—
B5126	—	—	—	96 (4)	82 (4)	79 (4)	73 (2)	74 (4)	53 (3)	—	—	—
B5142	—	—	—	65 (1)	112 (1)	72 (1)	—	—	—	—	—	—
B5143	—	—	—	93 (2)	90 (2)	89 (2)	104 (2)	89 (2)	93 (2)	—	—	—
B5145	—	—	—	73 (2)	88 (2)	63 (2)	—	—	—	—	—	—
B50116	70	97	91	148	106	96	64	—	—	71	—	—	97	116	93	96	87	98	—	—	—	—	—	—

PART 4

VARIETY X CULTIVATION

(i) Variety x Spacing Experiments

1. Appleton—Raheen—Lane 5

CANE

Fall Plants:	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	43·6	103	78	101	92	93	41·2	100	41·2
B41227	118	113	103	113	114	114	119	119	119
B4362	89	90	85	89	86	89	90	95	93
Close spacing	44·9	96	86	98	96	95	—	—	—
Wide spacing	99	103	86	98	94	97	—	—	—
Mean	104	103	90	102	99	43·0	42·6	101	—

	Drains	Varieties	Spacing
S.E. % g.m.	17·7	15·0	11·6
Sig. Diff.	—	6·5	—

CANE

1st Ratoons:	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	28·7	106	95	92	83	94	27·6	97	27·2
B41227	116	119	110	106	116	117	122	114	120
B4362	107	117	86	93	107	125	112	107	112
Close spacing	32·1	102	89	89	93	101	—	—	—
Wide spacing	92	101	84	84	88	98	—	—	—
Mean	96	102	87	87	91	32·0	30·8	95	—

	Drains	Varieties	Spacing
S.E. % g.m.	20·1	18·5	5·9
Sig. Diff.	3·0	8·5	1·9

SUCROSE

1st Ratoons:	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	13·7	96	94	100	103	99	13·4	101	13·5
B41227	97	95	99	94	100	99	99	99	99
B4362	99	101	105	109	104	103	102	108	105
Close spacing	13·1	102	105	102	107	102	—	—	—
Wide spacing	105	101	103	109	107	108	—	—	—
Mean	98	97	99	101	102	13·7	13·5	102	—

	Drains	Varieties	Spacing
S.E. % g.m.	9·3	8·7	5·9
Sig. Diff.	—	3·7	2·0

SUGAR

	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	3·9	103	89	91	84	93	3·7	98	3·6
B41227	111	111	108	100	115	114	119	113	121
B4362	104	115	89	100	111	130	114	116	117
Close spacing	4·2	104	93	91	100	104	—	—	—
Wide spacing	97	103	87	92	95	108	—	—	—
Mean	93	100	86	86	93	4·4	4·1	100	—

	Drains	Varieties	Spacing
S.E. % g.m.	21·8	21·4	8·1
Sig. Diff.	—	10·0	—

CANE

2nd Ratoons:	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	23·6	91	77	88	82	79	20·7	97	20·4
B41227	129	117	108	115	117	117	132	135	135
B4362	97	95	82	90	95	85	103	104	104
Close spacing	25·2	94	79	94	91	91	—	—	—
Wide spacing	103	95	88	88	92	84	—	—	—
Mean	116	108	95	105	105	22·1	23·1	97	—

	Drains	Varieties	Spacing
S.E. % g.m.	20·8	19·5	9·7
Sig. Diff.	—	9·1	—

SUCROSE

	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	11·6	104	104	99	102	106	12·0	97	11·9
B41227	98	103	105	97	104	106	100	97	100
B4362	112	116	113	120	114	116	111	111	112
Close spacing	12·0	104	104	101	105	106	—	—	—
Wide spacing	99	103	101	102	100	104	—	—	—
Mean	106	111	110	96	97	11·3	12·5	98	—

	Drains	Varieties	Spacing
S.E. % g.m.	7·5	7·9	6·5
Sig. Diff.	—	3·4	—

SUGAR

	A	B	C	D	E	F	Close spacing	Wide spacing	Mean
B37161	2·7	94	80	86	82	83	2·5	95	2·4
B41227	126	119	110	109	119	121	132	130	138
B4362	108	109	93	105	105	97	114	115	121
Close spacing	3·0	98	83	94	95	97	—	—	—
Wide spacing	103	98	89	88	91	86	—	—	—
Mean	111	111	94	100	106	100	2·9	100	—

	Drains	Varieties	Spacing
S.E. % g.m.	17·5	18·2	11·8
Sig. Diff.	—	8·9	—

A = Ridging with 12 ft. drain centres.
B = „ „ 18 ft. „ „
C = „ „ 24 ft. „ „
D = Cambering 12 ft. „ „
E = „ „ 18 ft. „ „
F = „ „ 24 ft. „ „
Close spacing = 4 ft. or 4 ft. 6 in. between rows.
Wide „ = 6 ft. between rows.

2. Jamaica Sugar Estates—Golden Grove—Section 32

CANE

Spring Plants	1	2	3	Mean
B37172	36·7	96	106	37·0
B4362	97	99	96	97
Mean	36·2	99	103	—
	Bank widths			Variety
S.E. % g.m. ..	18·5			8·6
Sig. Diff.	—			—

SUCROSE

	1	2	3	Mean
	13·9	99	100	13·9
	102	97	104	101
	14·0	97	101	—
	Bank widths			Variety
	8·1			4·2
	—			—

SUGAR

Spring Plants	1	2	3	Mean
B37172	5·1	95	107	5·1
B4362	99	97	100	98
Mean	5·1	97	104	—
	Bank widths			Variety
S.E. % g.m. ..	18·7			6·9
Sig. Diff.	—			—

	Cane				Sucrose				Sugar			
	1	2	3	Mean	1	2	3	Mean				
1st Ratoons												
B37172	58·4	106	112	57·1	13·3	98	98	13·1				
B4362	120	125	117	114	103	104	103	105				
Mean	66·9	105	104	—	13·5	100	99	—				
	Bank widths			Variety	Bank widths			Variety				
S.E. % g.m. ..	9·7			8·4	0·8			3·8				
Sig. Diff.	—			—	—			—				

	Sugar			
	1	2	3	Mean
1st Ratoons				
B37172	4·4	95	101	4·3
B4362	125	120	111	120
Mean	4·9	96	94	—
	Bank widths			Variety
S.E. % g.m. ..	9·4			8·1
Sig. Diff.	—			16·4

3. Rose Hall—Hibbert—Section 1

	Cane				Sucrose				Sugar			
	3 ft.	4 ft.	5 ft.	Mean	3 ft.	4 ft.	5 ft.	Mean	3 ft.	4 ft.	5 ft.	Mean
Spring Plants												
B3439	35·4	102	76	32·9								
B37161	85	123	86	106								
B41227	129	125	101	128		No juice figures				No juice figures		
Mean	37·2	111	83	—								
		Variety	Spacing									
S.E. % g.m. ..		12·6	16·3									
Sig. Diff.		12·0	13·7									
1st Ratoons												
B3439	23·2	129	87	24·4								
B37161	102	146	99	110								
B41227	127	175	112	131		No juice figures				No juice figures		
Mean	25·4	137	91	—								
		Variety	Spacing									
S.E. % g.m. ..		17·5	12·9									
Sig. Diff.		17·1	14·1									

3 ft. = 9 rows per plot.
4 ft. = 7 ,, ,, ,,
5 ft. = 6 ,, ,, ,,

	Cane				Sucrose				Sugar			
	3 ft.	4 ft.	5 ft.	Mean	3 ft.	4 ft.	5 ft.	Mean	3 ft.	4 ft.	5 ft.	Mean
2nd Ratoons												
B3439	28·9	101	90	21·1	16·2	97	101	16·0	3·5	98	91	3·4
B37161	99	116	97	107	98	95	102	99	96	110	100	106
B41227	142	142	116	137	95	103	102	101	136	147	120	139
Mean	24·7	105	89	—	15·8	101	104	—	3·9	107	93	—
		Variety	Spacing			Variety	Spacing			Variety	Spacing	
S.E. % g.m. ..		13·6	12·8			5·4	11·0			15·9	20·0	
Sig. Diff.		13·4	12·5			—	—			15·7	—	

3 ft. = 9 rows per plot.
4 ft. = 7 ,, ,, ,,
5 ft. = 6 ,, ,, ,,

4. Serge Island—Serge—Pasture Piece

	Cane				Sucrose				Sugar			
	A	B	C	Mean	A	B	C	Mean	A	B	C	Mean
1st Ratoons ..												
B37172 ..	37·3	105	94	37·2	15·1	101	99	15·1	5·6	107	94	5·6
B4362	93	103	89	95	111	109	112	111	104	113	100	106
Mean	36·0	108	95	—	16·0	99	100	—	5·7	107	95	—
		Variety	Trashing			Variety	Trashing			Variety	Trashing	
S.E. % g.m. ..		12·6	13·2			5·9	7·7			12·6	16·1	
Sig. Diff.		—	—			4·4	—			—	—	

	Cane				Sucrose				Sugar			
	A	B	C	Mean	A	B	C	Mean	A	B	C	Mean
1st Ratoons												
B37172	28·8	97	97	28·2	16·4	93	94	15·8	4·7	90	91	4·4
B4362	92	98	90	95	98	99	99	103	90	97	89	98
Mean	27·6	101	97	—	16·3	97	97	—	4·5	98	95	—
		Variety	Trashing			Variety	Trashing			Variety	Trashing	
S.E. % g.m. ..		10·2	6·7			7·1	7·0			12·2	11·5	
Sig. Diff.		—	—			—	—			—	—	

A = No trash relieved.
B = Trash relieved.
C = Trash relieved and banks reformed.

5. Vale Royal—Swanswick—Joe Piece 5

	Cane					Sucrose	Sugar
	A	B	C	D	Mean		
Spring Plants							
Co331	33·1	108	100	97	33·4		
B41227	100	104	99	93	98		
B4362	83	87	84	101	88	No juice figures	No juice figures
Mean	31·3	105	100	92	—		
		Variety		Spacing			
S.E. % g.m. ..		7·3		9·1			
Sig. Diff.		6·0		—			
1st Ratoons							
Co331	34·7	102	92	100	34·2		
B41227 ..	97	95	92	95	96		
B4362	74	73	69	65	72		
Mean	31·4	100	94	96	—	—	—
		Variety		Spacing			
S.E. % g.m. ..		13·2		20·3			
Sig. Diff.		10·1		—			
2nd Ratoons							
Co331	22·1	110	117	133	25·3		
B41227	135	117	114	97	101		
B4362	76	74	65	75	63	—	—
Mean	22·9	97	95	97	—		
		Variety		Spacing			
S.E. % g.m. ..		14·1		25·5			
Sig. Diff.		10·8		—			

A = Standard practice 4 ft. rows with drains 20 ft. apart.
B = 4 ft. rows with 20 ft. apart drains.
C = 4 ft. rows on 20 ft. cambered beds.
D = 6 ft. rows Louisiana banks 2 rows placed 2 ft. apart on each bank.

(ii) Variety x Booting Experiments

1. Frome—Masemure—Plantain Walk

	Cane			% Sucrose			Sugar		
	B_0	B_1	Mean	B_0	B_1	Mean	B_0	B_1	Mean
Spring Plants									
B41227	37·6	114	40·3	14·8	96	14·5	5·6	109	5·8
B42231	80	79	74	101	96	101	81	75	75
B4362	121	124	115	100	105	104	121	130	120
		Variety	Booting		Variety	Booting		Variety	Booting
S.E. % g.m. ..		27·0	11·3		4·7	4·2		25·3	11·1
Sig. Diff.		26·8	—		4·8	—		25·6	—
1st Ratoons									
B41227	46·8	91	44·7	13·9	100	13·9	6·5	92	6·2
B42231	69	69	73	102	102	102	70	71	74
B4362	100	98	104	104	105	104	104	103	108
		Variety	Booting		Variety	Booting		Variety	Booting
S.E. % g.m. ..		20·3	14·8		5·3	3·5		20·0	16·4
Sig. Diff.		19·3	—		—	—		19·4	—
2nd Ratoons									
B41227	42·4	108	44·0	12·5	104	12·8	5·3	112	5·6
B42231	85	93	86	106	104	103	89	96	88
B4362	100	101	97	115	109	109	115	110	106
		Variety	Booting		Variety	Booting		Variety	Booting
S.E. % g.m. ..		26·5	7·3		8·8	4·6		20·3	6·1
Sig. Diff.		—	—		—	—		—	—

2. Frome—Mint—Mt. Eagle—Mt. Eagle Garden

	Cane			% Sucrose			Sugar		
	B_0	B_1	Mean	B_0	B_1	Mean	B_0	B_1	Mean
Spring Plants									
B41227	33·4	121	36·9	14·1	93	13·6	4·7	110	5·0
B42231	84	72	71	98	99	103	83	71	73
B4362	123	114	107	107	106	111	131	120	119
		Variety	Booting		Variety	Booting		Variety	Booting
S.E. % g.m. ..		13·8	12·8		8·1	5·5		7·8	12·6
Sig. Diff.		13·2	—		8·0	—		7·8	—
1st Ratoons									
B41227	45·9	111	48·5	13·1	98	13·0	6·0	109	6·3
B42231	87	87	82	108	107	108	94	93	90
B4362	107	99	98	106	106	107	113	105	104
		Variety	Booting		Variety	Booting		Variety	Booting
S.E. % g.m. ..		14·5	12·1		6·1	7·0		11·9	10·9
Sig. Diff.		13·9	—		6·0	—		—	—
2nd Ratoons									
B41227	40·0	111	42·2	13·5	101	13·4	5·4	109	5·6
B42231	89	88	84	98	98	103	90	90	86
B4362	110	88	94	96	94	106	113	94	99
		Variety	Booting		Variety	Booting		Variety	Booting
S.E. % g.m. ..		15·8	12·4		5·8	3·4		13·5	12·4
Sig. Diff.		—	—		—	—		—	—

PART 5

CULTIVATION EXPERIMENTS

1. Appleton—Raheen—Pimento Piece (B41227)

	Cane			Sucrose			Sugar		
	K	R	Mean	K	R	Mean	K	R	Mean
Spring Plants									
L_0	36·5	95	35·2	15·8	103	16·0	5·8	97	5·6
L_1	108	129	122	100	99	98	108	127	119
Mean	37·6	107	—	15·8	101	—	6·0	107	—
S.E. % g.m. ..		12·8			6·1			15·1	
		Lime	Knifing		Lime	Knifing		Lime	Knifing
Sig. Diff.		12·4	—		—	—		14·6	—
1st Ratoons									
L_0	29·0	92	27·6	13·0	98	12·8	3·8	90	3·5
L_1	95	89	95	94	98	97	88	87	92
Mean	28·8	90	—	12·6	101	—	3·5	94	—
S.E. % g.m. ..		9·9			7·5			8·8	
		Lime	Knifing		Lime	Knifing		Lime	Knifing
Sig. Diff.		—	—		—	—		7·2	—

L_0 = No lime applied. L_1 = Lime applied at 20 tons marl/acre.
K = Cross knifing. R = Cross ripping.

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2. Caymanas—L and K Piece (B4362)

	K_0	K_1	T_0	T_1	F_0	F_1	S.E. % g.m.	Sig. Diff.
1st Ratoons								
Cane	46·7	101	48·1	95	46·6	103	11·2	—
Sucrose	11·8	103	12·1	100	12·2	99	6·6	—
Sugar	5·5	104	5·8	95	5·7	99	8·2	—
2nd Ratoons								
Cane	40·3	95	39·4	99	—	—	5·8	—
Sucrose	12·3	98	12·3	98	—	—	4·1	—
Sugar	5·0	92	4·8	98	—	—	7·8	—
3rd Ratoons								
Cane	38·9	101	38·8	101	39·4	98	10·7	—
Sucrose	11·7	101	11·6	103	11·9	98	11·8	—
Sugar	4·6	101	4·5	104	4·7	96	11·1	—

K_0 = No knifing. T_0 = No trash rowing. F_0 = No furrowing.
K_1 = Knifing. T_1 = Trash rowing. F_1 = Furrowing.

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3. Frome—Belle Isle—Meylersfield—Parkinson (B41227)

	Cane				Sucrose				Sugar			
	H	R	K	Mean	H	R	K	Mean	H	R	K	Mean
Spring Plants												
O	54·7	95	91	52·0	12·8	103	97	12·8	7·1	97	88	6·7
XR	100	93	88	98	96	94	96	96	97	88	85	94
XK	102	99	95	104	101	96	99	99	103	95	94	102
Mean	55·1	95	91	—	12·7	99	99	—	7·0	94	89	—
	S.	P.	S.P.		S.	P.	S.P.		S.	P.	S.P.	
S.E. % g.m. ..	10·3	6·1	7·8		6·7	6·4	5·0		10·9	6·7	7·8	
Sig. Diff. ..	—	—	—		—	—	—		—	—	—	

H = Harrowing. O = No Crossing. S = Straight Cultivation. R = Ripping.
XR = Cross ripping. P = Cross cultivation. K = Knifing. XK = Cross knifing.

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4. Frome—Belle Isle—Paul Island—Top Morass (B4362)

	Cane				Sucrose				Sugar			
	H	R	K	Mean	H	R	K	Mean	H	R	K	Mean
Spring Plants												
O	43·7	102	107	45·1	9·8	102	108	10·1	4·3	103	114	4·6
XR	97	108	101	99	107	98	107	101	103	105	108	99
XK	103	110	106	103	99	95	102	96	102	105	108	99
Mean	43·7	107	105	—	10·0	96	104	—	4·4	103	108	—
	S.	P.	S.P.		S.	P.	S.P.		S.	P.	S.P.	
S.E. % g.m. ..	5·2	2·4	1·9		4·1	6·2	9·7		11·0	8·1	11·1	
Sig. Diff.	—	—	—		4·8	—	—		—	—	—	
1st Ratoons												
O	41·4	108	109	54·7	13·2	100	99	13·2	6·9	107	107	7·3
XR	103	111	105	101	96	93	91	94	99	103	96	95
XK	104	102	108	99	98	98	101	99	102	99	109	98
Mean	53·0	104	105	—	13·0	99	99	—	6·9	103	104	—
	S.	P.	S.P.		S.	P.	S.P.		S.	P.	S.P.	
S.E. % g.m. ..	6·0	5·5	5·6		7·3	6·5	7·1		5·9	9·7	9·5	
Sig. Diff.	—	—	—		—	—	—		—	—	—	

H = Harrowing. O = No crossing. S = Straight cultivation. R = Ripping.
XR = Cross ripping. P = Cross cultivation. K = Knifing. XK = Cross knifing.

5. Frome—Masemure—Masemure—Belle Piece (B41227)

	Cane				Sucrose				Sugar			
	H	R	K	Mean	H	R	K	Mean	H	R	K	Mean
Spring Plants												
O	40·0	99	99	38·5	11·9	102	103	12·1	4·8	91	102	4·7
XR	94	93	100	99	103	92	98	96	96	85	97	95
XK	98	95	100	101	92	93	105	105	91	89	103	97
Mean	38·8	95	102	—	11·7	98	104	—	4·6	92	105	—
	S.	P.	S.P.		S.	P.	S.P.		S.	P.	S.P.	
S.E. % g.m. ..	10·7	4·8	7·3		7·7	12·9	10·8		14·0	11·8	13·9	
Sig. Diff.	—	—	—		—	—	—		—	—	—	
1st Ratoons												
O	51·4	87	97	48·7	12·6	98	98	[illegible]	6·5	85	95	6·1
XR	94	91	102	101	93	98	97	[illegible]	87	89	98	98
XK	101	96	95	103	99	99	98	[illegible]	100	95	93	103
Mean	50·7	93	99	—	12·2	101	101	—	6·2	94	100	—
	S.	P.	S.P.		S.	P.	S.P.		S.	P.	S.P.	
S.E. % g.m. ..	6·8	17·6	7·9		3·5	4·1	4·9		6·1	15·9	10·0	
Sig. Diff.	—	—	—		—	—	—		—	—	—	

H = Harrowing. O = No crossing. S = Straight cultivation. R = Ripping.
XR = Cross ripping. P = Cross cultivation. K = Knifing. XK = Cross knifing.

6. Frome—Frome—Fontabelle—Morass 12 (B4362)

	Cane				Sucrose				Sugar			
	H	R	K	Mean	H	R	K	Mean	H	R	K	Mean
Spring Plants												
O	40·8	104	104	41·8	12·4	98	97	12·2	5·1	101	101	5·1
XR	109	117	113	110	97	100	91	98	106	118	107	109
XK	105	118	109	108	96	97	100	99	101	115	109	107
Mean	42·7	108	104	—	12·1	100	98	—	5·2	108	103	—
	S.	P.	S.P.		S.	P.	S.P.		S.	P.	S.P.	
S.E. % g.m. ..	6·6	9·0	5·7		7·0	9·6	11·1		9·6	15·3	12·8	
Sig. Diff.	—	—	—		—	—	—		—	—	—	

H = Harrowing. O = No crossing. S = Straight cultivation. R = Ripping.
XR = Cross ripping. P = Cross cultivation. K = Knifing. XK = Cross knifing.

DRAW BED EFFECT

7. Frome—Belle Isle—Belle Isle—Morass (B4362)

	Distance from Interval in Chains				S.E. % g.m.	Sig. Diff.
	1	2	3	4		
Spring Plants						
Cane	44·7	88	85	89	2·2	6·4

8. Frome—Belle Isle—Meylersfield—Parkinson (B41227)

	Distance from Interval in Chains				S.E. % g.m.	Sig. Diff.
	1	2	3	4		
Spring Plants						
Cane	53·0	94	91	88	7·7	—

9. Frome—Belle Isle—Paul Island—Allman Piece (B41227)

	1	2	3	4		
Spring Plants						
Cane	51·3	95	92	86	1·6	4·8

10. Frome—Frome—Barham—Middle Ground (B4362)

	1	2	3	4		
Spring Plants						
Cane	49·1	92	92	83	7·0	12·0

11. Frome—Frome—Blue Castle—Guthrie Pen No. 2 (B41227)

	1	2	3	4		
Spring Plants						
Cane	51·4	110	97	77	4·5	13·7

12. Frome—Frome—Fontabelle—Morass 20 (B4362)

	1	2	3	4		
Spring Plants						
Cane	49·7	99	95	95	4·0	—

13. Frome—Frome—Frome—Cupid (B4362)

	1	2	3	4		
Spring Plants						
Cane	51·5	97	97	93	9·3	—

14. Frome—Masemure—Albany—Curing House (B4362)

	1	2	3	4		
Spring Plants						
Cane	50·1	88	89	91	2·4	7·0

15. Frome—Masemure—Masemure—Big Hill (B41227)

	1	2	3	4		
Spring Plants						
Cane	42·0	98	93	98	6·4	—

16. Frome—Masemure—Midgham—Three Corner (B41227)

	1	2	3	4		
Spring Plants						
Cane	46·0	81	76	87	6·3	—

17. Frome—Mint—Mint—Jameson (B41227)

	1	2	3	4		
Spring Plants						
Cane	44·4	82	78	83	8·3	—

18. Frome—Mint—Mt. Eagle—Ricketts (B41227)

	1	2	3	4		
Spring Plants						
Cane	51·7	107	108	107	5·3	—

19. Frome—Shrewsbury—Cornwall—John Grass (B4362)

	1	2	3	4		
Spring Plants						
Cane	36·1	95	89	86	2·5	7·5

20. Frome—Shrewsbury—Friendship—Browne (B41227)

	1	2	3	4		
Spring Plants						
Cane	42·3	93	83	100	3·3	9·9

21. Frome—Shrewsbury—Shrewsbury—Roaring River (B4362)

	1	2	3	4		
Spring Plants						
Cane	40·0	99	101	91	5·4	—

22. Frome—Shrewsbury—Shrewsbury—Top Marlie (B41227)

	Distance from Interval in Chains				S.E. % g.m.	Sig. Diff.
	1	2	3	4		
Spring Plants						
Cane	43·7	100	100	90	13·4	—
Summary:						
Cane	46·7	95	92	90	6·0	4·0

23. Frome—Belle Isle—Belle Isle—John Crow (B4362)

	A	B	C	D	E	S.E. % g.m.	Sig. Diff.
1st Ratoons							
Cane	60·1	98	92	100	99	5·1	—
Sucrose	15·1	99	92	93	97	6·8	—
Sugar..	9·3	98	86	93	97	7·8	—
2nd Ratoons							
Cane	56·3	96	105	99	97	10·4	—
Sucrose	13·7	105	109	99	106	5·5	—
Sugar..	7·7	100	114	98	103	10·3	—

A = Control.
B = Trash turned and no forking.
C = Alternate rows forked and trash replaced.
D = Alternate rows forked and trash not replaced.
E = Every row forked.

24. Frome—Blue Castle—Guthrie Pen 3 (B41227)

	A	B	C	D	E	S.E. % g.m.	Sig. Diff.
Spring Plants							
Cane	30·8	94	90	100	89	7·2	—
Sucrose	12·7	99	97	104	102	4·2	—
Sugar..	3·9	94	88	104	91	10·1	—
1st Ratoons							
Cane	31·8	108	101	107	103	5·4	—
Sucrose	14·4	99	101	102	103	2·9	—
Sugar..	4·6	107	102	109	106	3·5	—
2nd Ratoons							
Cane	36·7	107	111	107	108	8·8	—
Sucrose	13·4	97	102	101	102	6·3	—
Sugar..	4·9	105	114	109	109	8·3	—

A = Control.
B = Trash turned and no forking.
C = Alternate rows forked and trash replaced.
D = Alternate rows forked and trash not replaced.
E = Every row forked.

25. Frome—Mint—Mint—Plum Tree (B4362)

	A	B	C	D	E	S.E. % g.m.	Sig. Diff.
Spring Plants							
Cane	34·4	98	97	85	92	10·9	—
Sucrose	12·4	99	98	93	98	6·5	—
Sugar..	4·2	98	96	80	90	11·4	—
1st Ratoons							
Cane	32·2	103	101	103	95	13·8	—
Sucrose	12·9	98	96	101	92	5·2	—
Sugar..	4·2	102	97	104	87	12·7	—

A = Control.
B = Trash turned and no forking.
C = Alternate rows forked and trash replaced.
D = Alternate rows forked and trash not replaced.
E = Every row forked.

26. Richmond/Llandovery—Richmond—Cotton Tree 3 (B41227)

Plants	A	B	C	D	E	F	G	H	No extra S/A	Extra S/A	S.E. % g.m.	Sig. Diff.
Cane	36·8	94	97	104	117	112	104	99	38·4	98	13·5	—
Sucrose ..	12·4	107	95	94	98	92	94	100	12·2	100	8·3	—
Sugar	4·6	100	92	97	114	100	93	99	4·1	98	13·4	—
1st Ratoons									Close spacing	Wide spacing		
Cane	53·1	103	97	118	103	119	103	108	101	56·3	14·3	—
2nd Ratoons												
Cane	28·4	102	101	113	129	121	123	117			18·1	—

A = ½ chain cambered beds 4 rows.
B = ½ ,, ,, ,, 6 ,,
C = Louisiana banks 1 row bank.
D = ,, ,, 2 ,, ,,
E = Richmond method 3 ft. banks.
F = ,, ,, 5 ft. ,,
G = Flat and contour drains 3 ft. rows.
H = ,, ,, ,, 5 ft. ,,
(Extra S/A was applied to ½ of each plot)

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27. Serge Island—Serge—April (B37172)

Plants	Shallow furrow	Deep furrow	S.E. % g.m.	Sig. Diff.
Cane	41·96	104	11·4	—
1st Ratoons				
Cane	30·71	94	8·0	—
Sucrose ..	14·6	105	5·0	—
Sugar	4·5	99	8·3	—
2nd Ratoons				
Cane	30·7	98	14·3	—
Sucrose ..	15·5	100	2·3	—
Sugar	4·7	98	13·7	—

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28. United Estates—Whitewater 5 (B41227)

Spring Plants	5 ft. banks	10 ft. banks	S.E. % g.m.	Sig. Diff.	Straight planting	Staggered planting	S.E. % g.m.	Sig. Diff.	No flotal	10 cwts. flotal per acre
Cane	45·4	94	10·5	—	47·5	102	6·9	—	—	—
% Sucrose	11·7	99	4·8	—	12·9	100	3·7	—	—	—
Sugar	5·9	93	12·4	—	6·1	100	8·6	—	—	—
1st Ratoons										
Cane	52·2	90	7·9	—	50·1	98	7·6	—	49·9	101
Sucrose	12·4	98	4·9	—	12·1	102	7·5	—	12·0	99
Sugar	6·4	88	9·0	—	6·0	100	9·0	—	6·0	100

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29. Worthy Park—Cocoa Walk 3 (B41227)

Spring Plants	N	S	N	D	B_0	B_1	L_0	L_1	Mean
N_0	37·5	103	37·3	104	37·8	86	34·3	122	38·1
N_1	98	109	102	107	100	89	104	123	102
L_0	33·7	107	33·5	109	34·7	86	—	—	
L_1	121	129	124	127	118	105	—	—	
Mean	34·6	105	34·5	106	37·9	87	35·0	120	

Cane

	N	S	N	D
B_0	36·4	108	36·2	106
B_1	90	92	87	92

	Normal vs deep knifing				Normal vs subsoil fertilizer placement			
	A		B		A		B	
S.E. % g.m. ..	12·0		8·9		9·5		10·0	
	K	N	B	L	P	N	B	L
Sig. Diff.	—	—	4·5	4·0	4·8	—	5·0	4·5

CANE

	N	S	N	D	B_0	B_1	L_0	L_1	Mean
1st Ratoons									
N_0	43·2	105	44·7	99	47·5	90	42·0	111	44·4
N_1	106	114	108	105	105	105	111	116	107
L_0	43·0	106	45·5	95	47·3	91	—	—	
L_1	107	115	104	106	106	104	—	—	
Mean	44·6	107	46·5	98	48·7	95	44·3	108	

	N	S	N	D
B_0	47·6	105	49·9	95
B_1	94	101	92	93

	Normal vs deep knifing				Normal vs. subsoil fertilizer placement			
	A		B		A		B	
S.E. % g.m.	15·4		9·9		12·6		10·1	
	K	N	B	L	P	N	B	L
Sig. Diff.	—	4·2	4·6	4·2	5·8	4·2	4·7	4·3

Subsoiling: N = Normal.
D = Extra deep and half normal spacing between cuts.
Fertilizing: N = Normal method of application.
S = ½ S/A application, ½ M/K ,, , All S/P ,, } applied by tractor 6 in. below surface before planting.
½ S/A ,, , ½ M/K ,, } applied at same time as normal application and broadcast as normal.
B = 30 tons bagasse per acre.
L = 20 tons marl per acre.

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30. Worthy Park—Cocoa Walk 5 (B41227)

CANE

	A	B	C	D	Mean
Spring Plants					
4 ft.	44·9	110	106	101	46·8
5 ft.	94	98	97	105	94
6 ft.	84	83	90	97	85
Mean	41·6	105	106	109	—
		Planting	Spacing		
S.E. % g.m. ..		9·9	14·5		
Sig. Diff.		—	—		

CANE

	A	B	C	D	Mean
1st Ratoons					
4 ft. ..	41·3	122	104	118	45·8
5 ft. ..	115	123	128	125	111
6 ft. ..	102	106	107	117	97
Mean	43·6	111	107	114	—
		Planting	Spacing		
		10·4	17·6		
		8·0	—		

CANE

	A	B	C	D	Mean
2nd Ratoons					
4 ft.	37·9	114	107	131	42·9
5 ft.	125	135	128	126	114
6 ft.	105	111	111	104	95
Mean	41·7	109	105	110	—
		Planting	Spacing		
S.E. % g.m. ..		10·2	21·8		
Sig. Diff.		—	—		

A = Planting double type straight 2′ apart
B = ,, single ,, ,, 1′ ,,
C = ,, ,, ,, 9″ staggered 1′ apart
D = ,, ,, ,, 18″ ,, 1′ ,,

4 ft. = 6 rows x 4 ft.
5 ft. = 5 rows x 5 ft.
6 ft. = 4 rows x 6 ft.

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31. Innswood—St. Helen's—9c (B34104)

	A	B	C	D	S.E. % g.m.	Sig. Diff.
Fall Plants						
Cane	25·5	101	105	102	5·6	—
1st Ratoons						
Cane	36·9	91	96	99	5·1	—
Sucrose ..	11·5	101	100	98	9·6	—
Sugar	4·2	92	95	96	10·4	—
2nd Ratoons						
Cane	33·4	91	90	89	12·4	—
Sucrose ..	12·6	101	99	100	4·9	—
Sugar	4·2	92	89	89	13·7	—

A = Standard practice irrigating every row.
B = 10 ft. banks with 2 cane rows on each bank.
C = Irrigating every other furrow with drains 10 ft. apart.
D = ,, ,, ,, ,, ,, ,, 20 ft. ,,

32. Monymusk—Springfield—Beauchamp—Paradise 11 (B41227)

Spring Plants	1	2	3	4	5	S.E. % g.m.	Sig. Diff.
Cane	54·8	95	97	90	97	8·0	—
Sucrose	12·0	104	99	95	100	7·9	—
Sugar	6·6	99	95	85	97	14·0	—

1 = Normal irrigation
2 = Long line ,, (Bank planted).
3 = ,, ,, ,, (Furrow planted).
4 = Long line irrigation (alternate rows wet).
5 = ,, ,, ,, (double 9 ft. bank).

33. Sevens—Parnassus—Ball Ground—Section 89 ABC (B41227)

Spring Plants	1	2	3	4	5	S.E. % g.m.	Sig. Diff.
Cane	47·6	104	108	98	110	14·5	—
Sucrose	12·3	100	103	103	100	5·2	—
Sugar	5·9	104	110	101	110	16·8	—

1. Furrow planting ½ chain twigs.
2. Bank ,, ,, ,,
3. Long line—irrigate every furrow.
4. ,, ,, ,, ,, other furrow.
5. Long line—double banks.

34. Sevens—Parnassus—Ball Ground—Section 87 ABC (B41227)

	Cane				Sucrose				Sugar			
Spring Plants	O	2 cwt. S/A per acre	4 cwt. S/A per acre	Mean	O	2 cwt. S/A per acre	4 cwt. S/A per acre	Mean	O	2 cwt. S/A per acre	4 cwt. S/A per acre	Mean
W_1	95	103	114	103	102	99	97	100	97	103	111	104
W_2	122	102	101	107	95	98	97	98	117	101	98	108
W_3	42·6	96	106	42·8	12·5	99	99	12·4	5·3	96	104	5·2
Mean	45·0	95	101	—	12·4	100	98	—	5·6	93	100	—
	Nitrogen		Irrigation		Nitrogen		Irrigation		Nitrogen		Irrigation	
S.E. % g.m. ..	24·3		20·5		5·5		7·6		25·2		23·0	
Sig. Diff.	—		—		—		—		—		—	

W_1 = most frequent irrigation. W_2 = medium irrigation. W_3 = least frequent irrigation.

PART 6

CULTIVATION X IRRIGATION EXPERIMENTS

1. Caymanas—Cumberland Pen—24 and 25*

CANE

	Irrigation		Rows—distance apart		
	Surface	Overhead	5 ft.	2·5 ft.	Mean
Fall Plants					
B42231	65·5	67·5	63·2	69·7	66·5
B4362	67·5	69·1	72·2	64·4	68·3
5 ft. apart rows	67·6	67·8	—	—	—
2·5 ft. apart rows ..	65·4	68·8	—	—	—
Mean	66·5	68·3	67·7	67·1	67·4
		Variety	Spacing	Irrigation	
S.E. % g.m.		11·4	9·5	17·8	
Sig. Diff.		—	—	—	

SUCROSE

	Irrigation		Rows—distance apart		
	Surface	Overhead	5 ft.	2·5 ft.	Mean
Fall Plants					
B42231	12·8	12·5	12·9	12·4	12·7
B4362	12·8	12·3	12·3	12·8	12·6
5 ft. apart rows	12·9	12·4	—	—	—
2·5 ft. apart rows ..	12·8	12·4	—	—	—
Mean	12·8	12·4	12·6	12·6	12·6
		Variety	Spacing	Irrigation	
S.E. % g.m.		4·1	5·0	4·2	
Sig. Diff.		—	—	—	

SUGAR

	Irrigation		Rows—distance apart		
	Surface	Overhead	5 ft.	2·5 ft.	Mean
Fall Plants					
B42231	8·40	8·35	8·15	8·60	8·38
B4362	8·61	8·47	8·84	8·24	8·54
5 ft. apart rows	8·66	8·34	—	—	—
2·5 ft. apart rows ..	8·36	8·48	—	—	—
Mean	8·51	8·41	8·50	8·42	8·46
		Variety	Spacing	Irrigation	
S.E. % g.m.		11·4	10·2	17·8	
Sig. Diff.		—	—	—	

CANE

	Irrigation		Rows—distance apart		
	Surface	Overhead	5 ft.	2·5 ft.	Mean
1st Ratoons					
B42231	37·3	41·9	38·3	41·0	39·6
B4362	38·7	39·2	39·7	38·2	38·9
5 ft. apart rows	36·5	41·4	—	—	—
2·5 ft. apart rows ..	39·5	39·7	—	—	—
Mean	38·0	40·6	39·0	39·6	39·3
		Variety	Spacing	Irrigation	
S.E. % g.m.		21·9	10·3	13·7	
Sig. Diff.		—	—	—	

*Actual yields per acre given.

2. Monymusk—Salt Savannah—Cotton Walk 10*

Cane

Spring Plants	Irrigation deficits 1·2 in.	2·0 in.	3·4 in.	Cwt./acre sulphate of ammonia 6	3	0	Mean
B41227	35·7	32·7	30·2	33·9	33·1	32·7	33·2
B42231	32·6	33·9	27·9	31·4	31·8	31·1	31·5
N_6	33·9	32·2	31·8	—	—	—	—
N_3	35·0	35·1	27·3	—	—	—	—
N_0	33·6	34·1	28·0	—	—	—	—
Mean	34·1	33·8	29·0	32·6	32·4	31·9	32·3
		Irrigation		Variety		Nitrogen	
S.E. % g.m.		14·2		12·3		18·3	
Sig. Diff.		—		—		—	

Sucrose

Spring Plants	Irrigation deficits 1·2 in.	2·0 in.	3·4 in.	Cwt./acre sulphate of ammonia 6	3	0	Mean
B41227	10·2	10·6	10·3	10·5	10·2	10·4	10·3
B42231	10·3	9·3	10·2	9·8	10·0	10·0	9·9
N_6	10·0	10·1	10·3	—	—	—	—
N_3	10·2	10·0	10·1	—	—	—	—
N_0	10·5	9·8	10·3	—	—	—	—
Mean	10·2	9·9	10·2	10·1	10·1	10·2	10·1
		Irrigation		Variety		Nitrogen	
S.E. % g.m.		13·1		10·7		7·2	
Sig. Diff.		—		—		—	

Sugar

Spring Plants	Irrigation deficits 1·2 in.	2·0 in.	3·4 in.	Cwt./acre sulphate of ammonia 6	3	0	Mean
B41227	3·41	3·78	3·12	3·53	3·36	3·42	3·44
B42231	3·49	3·01	2·82	3·08	3·14	3·10	3·11
N_6	3·21	3·41	3·31	—	—	—	—
N_3	3·56	3·47	2·72	—	—	—	—
N_0	3·58	3·31	2·89	—	—	—	—
Mean	3·45	3·40	2·97	3·31	3·25	3·26	3·27
		Irrigation		Variety		Nitrogen	
S.E. % g.m.		12·5		12·6		19·8	
Sig. Diff.		0·38		0·27		—	

*Actual yields per acre given.

PART 7

DISEASE EXPERIMENTS

(*a*) CHLOROTIC STREAK

1. Jamaica Sugar Estates—Golden Grove 27 (B4362)

	Diseased setts	Healthy setts	Diseased setts heat treated	Healthy setts heat treated	S.E. % g.m.	Sig. Diff.
Spring Plants						
Cane	31·8	158	136	158	8·0	19·1
% Sucrose ..	14·1	100	97	101	9·0	—
Sugar	4·5	157	132	159	16·4	38·8
1st Ratoons						
Cane	33·1	127	129	127	7·3	15·1
% Sucrose ..	9·0	100	100	99	1·9	—
Sugar	3·0	127	129	126	7·6	15·8
2nd Ratoons						
Cane	39·3	108	111	101	5·8	—

(*b*) RATOON STUNTING

2. Appleton—Raheen—Gold Piece (B34104)

	C	D	I	S.E. % g.m.	Sig. Diff.
Fall Plants					
Cane	44·6	91	109	15·7	15·3
% Pol ..	12·7	99	92	11·0	—
Pol	5·6	88	101	19·8	—
1st Ratoons					
Cane	27·2	109	111	25·5	—
% Sucrose ..	11·9	95	101	9·6	—
Sugar	3·3	105	111	30·4	—

C = Clean tops. D = Suspected. I = Inoculated.

3. Long Pond—Gibraltar 2 (Co421)

	Not inoculated	Inoculated (A)	Not heat treated	Heat treated (B)	Diseased setts	Healthy setts (C)	S.E. % g.m.	Sig. Diff. A	Sig. Diff. B	Sig. Diff. C
Spring Plants										
Cane	31·1	95	28·8	110	29·7	104	8·5	—	7·8	—
% Sucrose ..	9·0	102	9·8	87	9·2	99	13·2	—	7·4	—
Sugar	2·8	95	2·8	95	2·7	104	16·1	—	—	—
1st Ratoons										
Cane	31·0	93	28·0	113	26·1	129	16·9	—	—	17·0
2nd Ratoons										
Cane	29·2	112	28·9	114	34·2	81	25·3	—	—	—
% Sucrose ..	11·9	99	11·7	103	11·8	101	8·4	—	—	—
Sugar	3·5	112	3·4	117	4·0	82	23·6	—	—	—

APPENDIX III

PART 1

FACTORY DATA COMPARED BY CROPS

TABLE I

JUICE QUALITY. CROPS 1953–57

	1953	1954	1955	1956	1957
Cane, Pol %	12·18	11·94	12·83	12·78	12·43
Absolute Juice—°Brix	17·29	17·02	18·14	17·92	17·70
Purity	81·79	81·61	82·73	82·98	81·89

TABLE II

MILLING FIGURES. CROPS 1953–57

	1953	1954	1955	1956	1957
Tons cane per hour (TCH)	52·75	56·23	59·56	61·40	64·34
Tons fibre per hour (TFH)	7·55	7·89	8·64	8·66	9·17
Imbibition % Fibre	134·05	139·59	134·11	126·78	127·71
Reduced Pol Extraction	95·24	94·88	95·21	94·99	94·72
Absolute Juice lost % Fibre (pol basis)	33·35	35·86	33·52	35·09	36·95
Pol % Bagasse	2·38	2·33	2·47	2·55	

TABLE III

LIME CONSUMPTION IN JAMAICAN FACTORIES. CROPS 1953–57

	Lbs. C_aO/Ton Cane					Lbs. C_aO/Ton Non-pol				
	1953	1954	1955	1956	1957	1953	1954	1955	1956	1957
†Monymusk	4·22*	2·95*	2·99*	3·84*	4·90*	148·9*	104·2*	102·7*	134·3*	157·83*
Richmond/Llandovery	1·22	1·49	1·78	1·78	1·64	46·9	60·6	75·0	75·7	68·42
Jamaica Sugar Estates	1·41	1·18	1·30	1·28	1·15	57·7	50·1	60·0	59·2	47·45
Frome	0·95	1·04	1·12	0·94	1·14	38·3	41·2	46·8	39·4	47·83
New Yarmouth	2·09	1·51	1·52	1·39	1·49	80·2	55·7	58·7	54·5	57·24
Caymanas	1·12	1·36	1·07	1·22	1·21	44·8	54·7	44·1	50·7	50·88
Innswood	1·17	0·98	0·98	0·98	0·78	44·1	38·2	44·5	44·7	31·23
Barnett	1·17	1·21	1·04	0·77	0·57	52·8	53·8	49·0	36·5	26·08
Worthy Park	1·10	1·46	0·93	1·16	1·56	59·0	79·3	49·5	58·8	77·16
Rose Hall	1·11	0·95	0·92	0·77	0·67	49·3	41·9	36·5	36·0	28·03
Green Park	1·08	—	—	—	—	42·6	—	—	—	—
Gray's Inn Central	1·17	1·62	1·51	1·21	1·15	46·3	62·1	59·2	47·1	40·86
Sevens	0·97	1·04	0·92	1·05	1·39	43·4	44·8	38·6	45·4	55·93
United Estates	1·40	1·28	1·29	1·05	0·99	62·6	56·2	58·8	47·1	45·83
Serge Island	1·35	1·28	1·35	1·66	1·50	51·4	54·7	60·9	83·7	74·69
Vale Royal	0·60	0·93	1·21	1·23	1·42	28·0	47·6	56·9	60·3	61·19
Appleton	0·95	0·97	0·78	1·25	0·66	47·3	43·2	40·5	58·8	30·07
Hampden	1·11	0·99	1·11	0·73	1·04	48·2	44·0	47·0	36·8	45·41
Bernard Lodge	1·53	1·55	1·72	1·60	1·41	63·6	69·7	71·9	69·9	59·40
Holland	1·21	1·25	1·53	1·01	1·04	49·1	49·1	60·8	38·3	40·28
Long Pond	1·91	1·34	1·47	1·95	1·88	86·2	65·5	45·1	96·0	84·93

*Includes Refinery Consumption. †New Factory in 1949.

TABLE IV

HEATER CAPACITIES. JAMAICAN FACTORIES. CROPS 1953–57

Factory	Cu. ft. M.Jc./Sq. ft. H.S./Hr.				
	1953	1954	1955	1956	1957
Monymusk	0·94	0·97	1·00	0·97	0·95
Richmond/Llandovery	1·16	1·35	1·31	1·32	1·15
Jamaica Sugar Estates	1·14	1·15	1·22	1·31	1·34
Frome	1·07	1·00	0·79	0·78	1·01
New Yarmouth	1·15	0·77	1·17	1·15	1·11
Caymanas	0·91	0·90	0·94	0·95	0·96
Innswood	1·03	1·11	1·20	1·16	0·82
Barnett	0·77	0·79	0·83	1·15	0·81
Worthy Park	1·01	1·07	1·03	1·10	0·74
Rose Hall	0·60	0·66	0·50	0·54	0·77
Green Park	0·36	0·27	—	—	—
Gray's Inn Central	1·04	1·03	1·03	1·01	0·97
Sevens	0·82	0·98	0·98	0·89	1·04
United Estates	1·24	0·74	0·82	0·88	0·84
Serge Island	1·03	1·09	1·08	0·95	0·95
Vale Royal	0·99	1·03	1·21	1·03	0·78
Appleton	0·66	0·77	0·83	0·84	0·97
Hampden	0·65	0·73	0·78	0·84	1·60
Bernard Lodge	0·94	0·95	0·91	0·97	1·00
Holland	0·72	0·61	0·65	0·45	0·72
Long Pond	0·55	0·72	0·68	0·62	0·67

TABLE V

ROTARY FILTER PERFORMANCE, CROPS 1953–57

Factory	Sq. ft. FA/TCH					Pol in Cake % Pol in Cane				
	1953	1954	1955	1956	1957	1953	1954	1955	1956	1957
Monymusk	3·96	3·82	3·69	3·77	3·70	0·45	0·49	0·43	0·49	0·54
Richmond/Llandovery	—	—	—	—	—	—	—	0·49	0·56	0·69
Jamaica Sugar Estates	—	—	—	—	—	—	—	0·48	0·56	0·53
Frome	3·36	2·63	3·81	3·79	3·70	0·24	0·26	0·22	0·21	0·20
New Yarmouth	4·91	4·94	4·78	4·74	4·92	0·67	0·38	0·45	0·43	0·60
Caymanas	5·59	5·47	5·35	5·23	5·22	0·40	0·54	0·33	0·46	0·43
Innswood	4·53	3·98	3·66	3·82	3·58	0·26	0·24	0·35	0·26	0·27
Barnett	—	5·82	5·34	4·92	4·72	—	0·27	0·35	0·36	0·37
Worthy Park	—	—	—	—	—	—	—	0·30	0·49	0·64
Rose Hall	—	—	—	5·75	5·40	—	—	0·53	0·39	0·37
Green Park	—	—	—	—	—	—	—	—	—	—
Gray's Inn Central	—	6·35	6·29	6·33	6·49	—	0·62	0·63	0·46	0·69
Sevens	—	3·45	3·26	3·52	3·21	—	0·27	0·34	0·26	0·39
United Estates	3·70	3·70	3·55	3·20	3·21	0·26	0·41	0·33	0·33	0·54
Serge Island	—	—	7·55	8·19	8·37	—	—	0·79	0·80	0·67
Vale Royal	—	7·70	6·37	6·04	5·63	—	0·62	0·62	0·43	0·35
Appleton	5·04	4·31	3·84	3·84	3·22	0·48	0·23	0·13	0·23	0·25
Hampden	—	—	6·06	5·51	5·57	—	—	0·40	0·76	0·62
Bernard Lodge	5·59	5·34	5·53	5·22	5·17	0·32	0·37	0·42	0·26	0·44
Holland	—	—	—	—	—	—	—	0·57	0·48	0·54
Long Pond	—	—	—	—	—	—	—	0·54	0·52	0·51

TABLE VI

FILTER STATION CONTROL FIGURES. CROPS 1953–57

	1953	1954	1955	1956	1957
Pol % Mud	2·40	2·02	1·84	2·06	2·11
Mud % Cane	2·29	2·29	2·43	2·51	2·55
Pol in Mud % Pol in Cane	0·45	0·39	0·35	0·40	0·43

TABLE VII

EVAPORATION RATES (AS LBS. EVAP./SQ. FT. H.S./HR.). CROPS 1953–57

Factory	°Brix Syrup					Lbs./Sq. ft. H.S./Hr.				
	1953	1954	1955	1956	1957	1953	1954	1955	1956	1957
Monymusk	58·67	54·67	54·92	57·87	57·76	8·67	8·67	7·17	6·99	6·87
Richmond/Llandovery ..	66·76	62·35	60·45	59·99	61·24	6·51	7·52	8·09	7·13	6·89
Jamaica Sugar Estates ..	57·81	57·56	56·59	57·41	62·14	6·54	6·62	5·67	6·33	6·63
Frome	48·99	57·97	59·89	57·63	54·43	9·83	7·98	7·94	7·67	7·70
New Yarmouth	63·60	66·11	63·42	62·99	60·36	7·57	7·68	7·62	7·40	7·16
Caymanas	57·77	54·75	62·12	64·12	61·39	4·77	4·63	5·02	4·59	4·57
Innswood	53·90	58·36	57·37	56·42	57·20	5·84	6·52	6·84	6·66	7·08
Barnett	58·51	57·53	59·13	59·40	57·67	7·08	7·35	7·53	8·26	8·30
Worthy Park	62·79	61·74	62·08	62·40	53·11	5·79	6·14	5·75	6·15	6·16
Rose Hall	60·96	59·99	63·37	61·53	58·97	6·66	8·02	8·01	8·45	6·46
Green Park	59·17	54·71	—	—	—	5·48	5·35	—	—	—
Gray's Inn Central ..	59·45	53·03	54·83	56·25	59·52	6·02	5·74	5·66	5·70	5·42
Sevens	61·64	64·32	64·78	65·47	62·06	6·38	6·75	6·63	6·75	7·00
United Estates	60·86	64·59	65·24	68·19	69·14	9·06	9·42	9·81	9·87	10·02
Serge Island	55·16	48·88	54·30	54·32	53·33	8·94	9·20	9·02	8·06	7·89
Vale Royal	58·36	60·64	61·28	59·28	62·05	8·34	8·89	7·22	7·63	8·13
Appleton	58·12	46·64	48·82	58·26	57·57	6·33	6·91	7·34	7·61	9·23
Hampden	57·70	59·40	59·96	60·22	60·91	6·04	7·18	7·27	7·75	7·89
Bernard Lodge	60·83	61·43	61·91	65·46	62·26	5·36	5·40	5·08	5·57	5·61
Holland	52·35	57·72	60·35	57·35	62·43	4·93	4·84	5·02	5·05	5·65
Long Pond	51·19	52·42	58·95	56·20	52·49	6·89	7·90	8·90	8·48	7·52

TABLE VIII

POLARIZATIONS, MOISTURES, SAFETY FACTORS AND PERMISSIBLE MOISTURES—EXPORT SUGAR. CROPS 1953–57

Factory	°Polarization					% Moisture				
	1953	1954	1955	1956	1957	1953	1954	1955	1956	1957
Monymusk	96·01	96·59	96·49	97·97	97·09	1·10	1·14	0·96	0·58	0·67
Richmond/Llandovery	—	—	—	96·70	—	—	—	—	0·87	—
Jamaica Sugar Estates	—	—	—	97·58	—	—	—	—	0·94	—
Frome	95·96	96·23	96·57	96·87	96·75	1·07	1·07	0·94	0·82	0·73
New Yarmouth	97·42	97·32	97·68	97·74	97·71	0·61	—	0·58	0·55	0·60
Caymanas	97·50	97·57	97·21	97·38	97·52	—	—	—	—	0·80
Innswood	97·01	97·01	97·28	97·09	97·20	0·96	0·99	0·90	0·86	0·85
Barnett	96·62	97·48	97·09	97·64	97·80	0·99	1·00	0·99	0·96	0·80
Worthy Park	97·09	96·92	97·21	97·11	97·12	1·03	1·05	1·03	0·99	1·00
Rose Hall	96·72	97·28	97·09	97·25	97·12	0·86	0·83	0·85	0·80	0·85
Green Park	—	—	—	—	—	—	—	—	—	—
Gray's Inn Central	96·43	96·57	97·15	97·21	97·33	1·05	1·00	0·81	0·87	0·80
Sevens	96·45	96·54	97·10	97·33	97·54	—	0·73	0·68	0·65	0·64
United Estates	97·10	97·02	97·05	97·70	97·58	0·86	0·85	0·89	0·84	0·72
Serge Island	96·67	96·88	96·86	97·08	97·32	0·89	0·83	0·92	0·96	0·96
Vale Royal	—	—	—	97·12	97·19	0·72	—	—	0·64	0·68
Appleton	97·56	97·18	97·42	97·08	97·01	0·94	0·86	0·87	0·84	0·84
Hampden	97·42	97·96	98·10	98·18	98·02	0·88	0·87	0·87	0·88	0·91
Bernard Lodge	97·17	—	97·45	97·47	97·72	—	—	0·90	—	—
Holland	96·67	96·94	96·51	96·91	97·12	—	0·83	0·91	0·84	0·84
Long Pond	—	97·57	—	97·58	97·22	—	—	—	0·64	0·64

Factory	Safety Factor					Permissible % Moisture				
	1953	1954	1955	1956	1957	1953	1954	1955	1956	1957
Monymusk	0·276	0·334	0·274	0·286	0·230	1·00	0·85	0·88	0·51	0·73
Richmond/Llandovery	—	—	—	0·264	—	—	—	—	0·83	—
Jamaica Sugar Estates	—	—	—	0·390	—	—	—	—	0·61	—
Frome	0·265	0·284	0·274	0·262	0·225	1·01	0·94	0·86	0·78	0·81
New Yarmouth	0·170	—	0·250	0·243	0·262	0·65	0·67	0·58	0·57	0·57
Caymanas	—	—	—	—	0·323	0·63	0·61	0·70	0·66	0·62
Innswood	0·321	0·331	0·331	0·296	0·304	0·75	0·75	0·68	0·73	0·70
Barnett	0·293	0·397	0·340	0·407	0·364	0·85	0·63	0·73	0·59	0·55
Worthy Park	0·354	0·341	0·369	0·343	0·347	0·73	0·77	0·70	0·72	0·72
Rose Hall	0·262	0·305	0·292	0·291	0·295	0·82	0·68	0·73	0·69	0·72
Green Park	—	—	—	—	—	—	—	—	—	—
Gray's Inn Central	0·294	0·292	0·284	0·312	0·300	0·89	0·86	0·71	0·70	0·67
Sevens	—	0·211	0·234	0·243	0·260	0·89	0·87	0·73	0·67	0·62
United Estates	0·297	0·285	0·302	0·365	0·298	0·73	0·75	0·74	0·58	0·61
Serge Island	0·267	0·266	0·293	0·329	0·358	0·83	0·78	0·79	0·73	0·67
Vale Royal	—	—	—	0·222	0·242	—	—	—	0·72	0·70
Appleton	0·385	0·305	0·337	0·288	0·281	0·61	0·71	0·65	0·73	0·75
Hampden	0·341	0·426	0·456	0·484	0·460	0·65	0·51	0·48	0·46	0·50
Bernard Lodge	—	—	0·353	—	—	0·71	—	0·64	0·63	0·57
Holland	—	0·271	0·261	0·272	0·292	0·83	0·77	0·87	0·77	0·72
Long Pond	—	—	—	0·264	0·230	—	0·61	—	0·61	0·70

TABLE IX

PER CENT. GROSS GRINDING TIME. CROPS 1953–57

	1953	1954	1955	1956	1957
Non-Factory Stoppages	16·47	15·11	14·81	15·41	20·47
Factory Stoppages	7·85	7·72	7·20	7·66	7·84
Time Grinding	75·68	77·17	77·99	76·93	71·69

TABLE X

POL BALANCE (% POL IN CANE). CROPS 1953–57

	1953	1954	1955	1956	1957
Pol in Sugars	84·11	84·33	84·48	84·82	83·39
Pol in Bagasse	5·57	5·53	5·69	5·75	6·14
Pol in Molasses	8·33	8·23	7·97	7·64	8·06
Pol in Filter Cake	0·45	0·39	0·35	0·40	0·43
Pol in Undetermined	1·54	1·52	1·51	1·39	1·98

TABLE XI

COMPARATIVE CONTROL FIGURES. CROPS 1953–57

	1953	1954	1955	1956	1957
Pol % Cane	12·18	11·94	12·83	12·78	12·43
Mixed Juice—Purity	82·21	82·02	83·17	83·38	82·29
Tons Cane/Ton 96° Sugar	9·37	9·53	8·86	8·86	9·26
Boiling House Efficiency	97·51	97·85	97·46	97·78	97·22
Pol in Sugars % Pol in Cane	84·11	84·33	84·48	84·48	83·39
Pol in Molasses % Pol in Cane	8·20	8·23	7·97	7·64	8·06

TABLE XII

MOLASSES FACTORS. CROPS 1953–57

Factory	1953	1954	1955	1956	1957
Monymusk	46·72	44·62	45·25	44·11	46·14
Richmond/Llandovery	37·05	38·26	40·57	40·49	39·40
Jamaica Sugar Estates	42·33	38·91	38·89	39·30	40·04
Frome	35·32	33·98	37·76	38·64	37·02
New Yarmouth	38·34	38·10	38·78	37·61	37·44
Caymanas	39·72	39·65	40·15	38·92	40·05
Innswood	45·24	47·32	57·14	49·76	45·55
Barnett	42·73	42·62	44·81	37·74	38·01
Worthy Park	31·90	41·69	45·20	37·90	37·89
Rose Hall	48·13	52·45	44·45	38·71	36·13
Green Park	—	—	—	—	—
Gray's Inn Central	37·31	39·03	42·62	40·42	36·44
Sevens	41·37	39·86	36·78	40·68	39·28
United Estates	38·35	38·31	36·77	37·88	40·86
Serge Island	37·62	35·62	38·99	45·03	42·33
Vale Royal	35·25	39·72	38·06	36·69	36·18
Appleton	33·63	29·67	30·12	30·03	40·35
Hampden	38·12	42·87	46·91	48·53	38·96
Bernard Lodge	43·66	45·44	43·24	38·16	42·51
Holland	46·71	37·02	40·11	35·70	39·00
Long Pond	37·98	38·77	27·06	36·80	36·78

TABLE XIII

QUALITY OF CANE SUPPLIED TO JAMAICAN FACTORIES, EXPRESSED AS POSSIBLE TONS CANE/TON 96° SUGAR

(Calculated on a basis of assumed Mill Extraction of 96·50, a B.H.E. (Winter Carp) of 100 and Pol % Cane and Purity of Mixed Juice as reported.)

(Calculated on Copp's Tables—Spencer Meade, page 762.)

Factory	1953	1954	1955	1956	1957	5-Year averages
Monymusk	9·12	8·98	9·08	8·85	9·41	9·09
Richmond/Llandovery	8·36	8·98	8·62	8·49	8·35	8·56
Jamaica Sugar Estates	9·77	9·61	8·34	8·84	8·73	9·06
Frome	9·03	9·32	8·04	8·07	8·89	8·67
New Yarmouth	8·62	8·79	8·26	8·22	8·69	8·52
Caymanas	8·64	8·83	8·30	8·48	8·46	8·53
Innswood	8·80	9·09	8·01	8·48	8·43	8·56
Barnett	8·66	9·04	8·05	7·86	8·10	8·34
Worthy Park	7·27	7·42	6·89	7·08	7·15	7·16
Rose Hall	7·56	8·35	8·10	7·82	8·46	8·06
Green Park	8·73	9·77	—	—	—	—
Gray's Inn Central	9·84	10·18	9·29	9·67	9·12	9·62
Sevens	8·54	8·66	8·36	8·55	8·65	8·55
United Estates	8·44	8·76	7·88	7·81	7·96	8·17
Serge Island	8·20	8·51	7·78	8·11	7·90	8·10
Vale Royal	8·72	8·94	8·53	8·44	8·47	8·62
Appleton	7·98	8·90	7·85	7·79	8·31	8·17
Hampden	8·77	9·26	8·19	7·64	8·09	8·39
Bernard Lodge	8·69	8·59	8·12	8·23	8·08	8·34
Holland	8·85	9·97	8·11	8·84	8·36	8·83
Long Pond	9·07	9·49	8·64	8·77	8·81	8·96
Island Averages	8·83	9·02	8·33	8·35	8·65	8·64

PART 2

FACTORY DATA—1957 CROP

TABLE I

FACTORY EQUIPMENT DATA—1957 CROP
(As Reported by the Factories)

Factories	Width Carrier	Knives			Crusher and Mills	Total Rolls	Remarks
		Setts	Blades/Setts	H.P.			
Monymusk	78″	2	38/38	200/200	3 RC 35½″ × 78″, 15 RM 35″ × 78″	18	Same as 1956 crop.
Richmond-Llandovery ..	41″	1	22	40	12 RM 22″ × 42″, 6 RM 24″ × 42″	18	Induced draught fan installed and used during the second part of crop. Result satisfactory.
Jamaica Sugar Estates ..	60″	2	30/30	80/150	2–2 RC 30″ × 60″, 12 RM 30″ × 60″	16	For 1957 crop: Desuperheater and make-up valve to the 10 lb. exhaust line automatic pH control. For 1958 crop: 70 tons capacity sugar bin with elevator and conveyor, new syrup pump, new heater supply pump and additional factory water supply pump.
Frome	78″	2	38/38	300/200	3 RC 35½″ × 78″, 12 RM 35″ × 78″	15	Surplus Bagasse Incinerator was installed and used for 1957 crop.
New Yarmouth	52″	2	26/36	150/140	3 RC 28½″ × 54″, 12 RM 26″ × 54″	15	For 1957 crop: 4,020 sq. ft. WIF, B. & W. Boiler, 320 p.s.i. Ward furnace. 1,500 kW. turbo-alternator, condensing and extracting at 15 p.s.i. Bulk store and bulk shipment of sugar. 2-ton Maxwell-Boulogne Juice Scale. New equipment for 1958 crop: Ash elevator and conveyor. Water softening and filtration plant for Raw Boiler Water. Additional Heating Surface in evaporator vessels 2, 3 and 4.
Caymanas	48″	1	32	110	3 RC 24″ × 48″, 12 RM 24″ × 48″	15	For 1957 crop: No. 4 Boiler (Ward Furnace boiler installed 1955) was fitted with oil fuel firing equipment for stand-by and out of crop distillery steam supply. The Corliss valve engine driving the mill gear train was fitted with new cylinder, tail end cover, piston and piston rod. For 1958 crop: Roller bearing throughout mill gear train. Farval automatic lubrication to hydraulic rams.
Innswood	42″	1	24	75	3 RC 24″ × 42″, 12 RM 24″ × 42″	15	For 1957 crop: 1 Simon Bagging and weighing machine. 4–600 cu. ft. Water Cooled (Blanchard) Crystallizers (increased furnace area on No. 1 Boiler by one-third and extra drum added to make Tri Drum Boiler). Converted to bulk shippping of sugar. Extra 200 cu. ft. Belt on No. 1 Vacuum Pan. For 1958 crop: 9,500 sq. ft. H.S. Evaporator with Automatic Juice Level Control. 6–42″ × 24″ Water Driven Centrifugals. 1 Vibrating Screen, 2nd set Cane Knives, 100 h.p. 6–15,000 gal. capacity Cooper Bearing Steel Fermenting Vats. 1–15,000 gal. capacity Cooper Bearing Steel Mixing Cistern. 2–3,000 gal. Glass Lined Butts for Rum storage. 1–500 gal. Glass Lined Tank for storing distilled water. During 1957 crop a new 2-column Still of modern design was used for the first time. Excellent product produced.
Barnett	40″	2	24/28	75/120	3 RC 23″ × 36″, 12 RM 22″ × 36″	15	For 1957 crop used 3–250 cu. ft. Natural Cooling and installed 1,350 cu. ft. Water Cooling Crystallizers.
Worthy Park	42″	1	24	45	3 RC 22½ ″× 42″, 3 RM 22½″ × 42″, 9 RM 24″ × 42″	15	During 1957 crop: grinding rate was increased from 28·97 to 31·8 tons cane per hour. Installed new 2nd Mill Engine allowing heavier weighting of 3, 4 and 5 mills. For 1958 crop: 1 extra Crystallizer for Java Sugars, 400 cu. ft., and 1 extra Mingler for storing seed, 300 cu. ft. 1 extra Fermenting Vat, 2,000 gal.
Rose Hall	38″	1	26	75	15 RM 24″ × 42″	15	For 1957 crop: 1–7½ ton Steam Driven Crane, 1 Centrifugal Pump for Raw Juice and 1 Cent. Pump for Quad Supply.
Gray's Inn Central ..	60″	1	10	15	2 RC 26″ × 60″, 12 RM 30″ × 60″	14	For 1957 crop: new B. & W. Water Tube Boiler, new self supporting chimney, new mill motor, remote control factory water service. Two replacement 100,000 gal. Vats. For 1958: Thermofeed feed water regulators for boiler. New Arca make up valve for quads. Diesel Locomotive for sugar store, and 1–125,000 gal. final molasses storage tank.
Sevens	54″	1	26	200	12 RM 32″ × 60″	12	For 1957 crop: Cross Carrier for Road Crane; Bulk Sugar Bin and Conveyor. All Steel Head Stocks for 3rd Mill. Increased Steam inlet to No. 1 Vessel of the Evaporator.
Bybrook	39″	1	24	75	3 RM 26½″ × 42″, 3 RM 25½″ × 42″, 6 RM 24″ × 42″	12	Same as 1956 crop.

TABLE I *continued on page 78*

TABLE I—*continued*

Factories	Width Carrier	Knives			Crusher and Mills	Total Rolls	Remarks
		Setts	Blades/Setts	H.P.			
Serge Island	48″	1	22	220	3 RC 26″ × 48″, 9 RM 24″ × 48″	12	For 1957 crop: 1–5,000 sq. ft. John Thompson Boiler with Eisner Furnace gave satisfactory performance. For 1958 crop: installing new 3rd Mill or 4th unit to replace the present 4th unit, and sugar bin for bulk loading and shipping.
Vale Royal	42″	1	30	75	12 RM 24″ × 42″	12	For 1957 crop: Mobrey Juice Level control apparatus fitted to quad worked satisfactorily. New set of knives and 75 h.p. High Speed Engine added. (Two sets now in use.)
Appleton	42″	2	26/52	75/90	3 RC 26″ × 42″, 9 RM 25″ × 42″	12	For 1957 crop: new equipment installed, ⅜″ Pitch Farrel H.D. Cane Knife Set. NZa Sigmund chokeless Juice Pumps fitted 3rd and 4th Mills. 200 kW. Elliot Turbo Alternator. S. & K. Condenser No. 36 fitted to Evaporator. Additional Belt and Tray added to Bach Subsider. New equipment contemplated for 1958: 7½-ton George King Gantry Cane Crane. Edwards Hydraulics for all Mills. 5,366 sq. ft. C.E. Water Tube Boiler Type VU10. 300 kW. Borsig Turbo Alternator. Two 49″ × 24″ B.M.A. Electrically Driven High Grade Centrifugals. Lea Maceration Water Recorder 40,000 lb. per hour. Link Belt Sugar Conveyor 18″ wide × 160′ 0″ long. Ex Innswood Quad and Existing 1st Vessel forming New Quintuple effect.
Hampden	44″	2	20/16	100/50	12 RM 24″ × 48″	12	For 1957 crop—new Hepworth 40″ × 24″ centrifugals, water driven, automatic P.H. controller for liming. 3 new 475 sq. ft. High Grade Juice Heaters. ¾-ton Maxwell Bolougne Scale for molasses and Blanchard Cooling coils for "C" sugars.
Bernard Lodge	87″	1	42	180	2 RC 34″ × 87″, 6 RM 37″ × 84″, 3 RM 38″ × 84″	11	For 1958 crop: alterations to Cane Handling System. Elimination of Railway. All cane will be delivered over two road scales in factory yard to new 6-ton tower crane (radius 60 ft.) and one new 10-ton Gantry crane (span 40 ft., travel 150 ft.). Two new 6-ton Mobile Diesel cranes operating in factory yard will facilitate stacking and supply to mill—150′ × 9′ 6″ wide extension to cane carrier. New set of knives, 42 blades driven by 100 h.p. high speed steam engine. Installation of "Permutit" Water Conditioning Plant for boiler feed water. New H.R.T. Boiler 3,300 sq. ft. H/S to replace an old unit.
Holland	36″	1	18	40	2 RC 20″ × 36″, 9 RM 22″ × 36″	11	For 1957 crop: Superheater and additional tubes for boiler. For 1958: new Boiler, new Chimney, Calandria Pan, Crystallizers and new 1st Motion gearing to increase Roller Speed.
Long Pond	43″	1	33	60	9 RM 24½″ × 48″	9	For 1957 crop: Boilers. Water Tube increased from 9,250 sq. ft. H/S to 10,350 sq. ft. H/S.

TABLE II

Factory Stations Capacities, 1957

		Mony-musk	Rich-mond/ Llan-dovery	Jamaica Sugar Estates	Frome	New Yar-mouth	Cay-manas	Inns-wood	Bar-nett	Worthy Park	Rose Hall	Gray's Inn Central	Sevens	By-brook	Serge Island	Vale Royal	Apple-ton	Hamp-den	Ber-nard Lodge	Holland	Long Pond	Totals and Averages
Per Ton Cane/Hour:																						
Boilers																						
As Water Tube	sq. ft. H.S.	234	277	381	203	329	388	315	299	274	288	297	344	273	352	234	424	292	188	216	379	283
Superheater	sq. ft. H.S.	38	—	59	33	43	—	—	25	—	—	15	—	—	—	—	32	—	3	—	—	33
Juice Heaters	sq. ft. H.S.	30	27	22	31	26	34	36	36	43	40	29	30	38	31	39	31	18	31	43	46	31
Filters																						
Presses	sq. ft. F.A.	—	43	45	—	—	—	—	—	292	—	—	—	—	—	—	—	—	—	67	55	45
Rotary	sq. ft. F.A.	3·70	—	—	3·70	4·92	5·22	3·58	4·72	—	5·40	6·49	3·21	3·26	8·37	5·63	3·22	5·57	5·17	—	—	4·46
First Subsiders																						
Continuous	cu. ft. ..	44	80	67	76	104	97	57	94	61	72	73	52	62	134	78	64	73	87	—	91	73
Intermittent	cu. ft. ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	110	—	110
Second Subsiders																						
Intermittent	cu. ft. ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23	—	23
Evaporators																						
Cl. Juice Heaters	cu. ft. H.S.	10	—	—	9	10	—	12	11	14	13	—	—	5	—	11	8	11	—	—	22	10
As Quad	sq. ft. H.S.	192	217	230	191	197	353	197	167	235	234	247	218	162	167	187	158	173	271	269	184	209
Per Ton Commercial Sugar/Hour:																						
Evaporators																						
As Quad	sq. ft. H.S.	1,993	1,917	2,183	1,781	1,896	3,202	1,844	1,468	1,825	2,145	2,414	2,082	1,385	1,439	1,682	1,542	1,639	2,465	2,451	1,806	1,955
Vacuum Pans																						
As Calandria	sq. ft. H.S.	536	195	536	370	506	474	378	452	395	—	650	339	348	486	404	461	441	620	—	582	458
	cu. ft. ..	383	280	337	256	354	289	364	371	315	289	417	252	215	281	258	325	266	399	306	376	317
Syrup Tanks	cu. ft. ..	199	147	203	127	227	247	110	162	127	113	273	116	143	285	152	125	177	376	240	186	187
A and B Molasses Tanks																						
	cu. ft. ..	529	354	406	305	319	247	589	337	450	339	663	326	290	518	298	375	273	563	637	412	405
Crystallizers																						
Natural Cooling	cu. ft. ..	—	—	467	—	265	—	510	900	391	385	417	—	149	482	—	498	211	704	516	—	448
Air Cooled (Pit.)	cu. ft. ..	—	581	—	—	—	493	—	—	—	449	—	—	—	—	1,076	—	—	—	—	1,075	724
Water Cooled	cu. ft. ..	508	425	778	280	483	—	536	374	—	449	985	635	446	400	—	541	368	—	546	—	494
	sq. ft. C.A.	188	184	118	104	63	—	16	—	—	199	289	—	223	120	—	—	227	—	—	—	150
Total Installed:																						
Pug Mill L.G. Sugars	cu. ft. ..	574	75	149	—	550	—	26	80	—	—	84	67	58	90	—	—	—	—	—	320	2,073
Water Heated	sq. ft. ..	—	—	—	—	—	—	—	—	—	—	—	14	—	—	—	—	—	—	—	—	14
Vapour Heated	sq. ft. ..	—	—	—	—	—	—	—	—	55	—	—	—	118	—	—	—	—	—	—	—	173
Centrifugals																						
High Grade Sugars	No. Off.	8	6	6	9–4	4	8	6	6	5	4	6	6	6	6	7	5	3	8	3	3	119
Size: Height	ins. ..	20	18	20	20–20	24	18	18	18	18	18	18	18	18	18	14	24	24	24	18	24	20
Diameter	ins. ..	42	30	42	42–42	40	36	30	30	36	36	36	36	30	36	30	40	42	40	30	42	37
Operating Speed	r.p.m. ..	1,200	1,200	1,000	1,000–1,500	50–850–1,750	1,000	1,400	1,100	1,200	1,100	1,220	1,200	1,300	1,000	1,200	1,000	1,200	1,100	1,200	1,200	1,129
Gravity Factor		860	615	595	595–1,340	1,675	510	835	515	735	620	760	735	720	510	615	565	860	685	615	860	670
Low Grade Sugars	No. Off. ..	12	6	6–2	13	4	4	5	6	2–1	5	7	6	4	3	5	3	3	4	2	2	105
Size: Height	ins. ..	20	18	20–24	20	24	18	18	18	18–18	18	18	18	18	20	18	18	24	24	18	24	20
Diameter	ins. ..	42	30	42–42	42	40	42	30	30	30–36	30	36	36	36	42	30	30	40	42	30	42	36
Operating Speed	r.p.m. ..	1,200	1,200	1,000–750–1,500	1,000	1,650	1,300	1,400	1,100	1,200–1,200	1,200	1,140	1,200	1,200	1,000	1,200	1,200	1,800	1,400	1,200	1,200	1,228
Gravity Factor		860	615	595–755	595	1,550	1,005	835	515	615–735	615	665	735	735	595	615	615	1,840	1,170	615	860	770
Affination	No. Off. ..	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
Size: Height	ins. ..	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20
Diameter	ins. ..	42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42
Operating Speed	r.p.m. ..	1,200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,200
Gravity Factor		860	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	860
Refinery	No. Off. ..	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
Size: Height	ins. ..	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20
Diameter	ins. ..	42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42
Operating Speed	r.p.m. ..	1,200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,200
Gravity Factor		860	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	860

TABLE III

Factory Quantities—1957 Crop

	Mony-musk	Rich-mond/ Llan-dovery	Jamaica Sugar Estates	Frome	New Yar-mouth	Cay-manas	Inns-wood	Bar-nett	Worthy Park	Rose Hall	Gray's Inn Central	Sevens	By-brook	Serge Island	Vale Royal	Apple-ton	Hamp-den	Ber-nard Lodge	Holland	Long Pond	Totals and Averages
Tons Cane:																					
Estate Ground	481,010	47,809	102,617	412,514	111,275	107,647	71,264	28,462	44,796	35,866	56,814	67,284	*79,892	37,584	55,736	72,524	63,801	128,621	36,610	50,184	2,092,310
Purchased Ground ..	134,174	4,069	58,043	376,397	81,621	10,236	64,586	38,284	42,936	24,117	69,810	109,445	50,495	40,180	25,328	31,274	71,854	38,711	7,126	27,446	1,297,132
Total Ground	615,184	51,878	160,660	779,991	192,896	117,883	135,850	66,746	87,732	59,983	126,624	176,729	130,387	77,764	81,064	103,798	135,655	167,332	43,736	77,630	3,389,442
Total for Sugar Manuf. ..	614,944	51,878	160,660	779,490	192,896	117,883	135,850	66,746	87,732	59,983	126,624	176,729	130,387	77,764	80,861	101,578	129,365	167,323	43,736	71,598	3,374,027
Ground for Other Purposes	240	—	—	421	—	—	—	—	—	—	—	—	—	—	203	2,220	6,290	9	—	6,032	15,415
Bagasse																					
Estimated Surplus Tons	—	—	1,500	3,950	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fuel																					
Wood used: Factory »	—	1,425	—	150	—	—	190	1,151	—	2,020	516	500	300	1,090	600	1,000	458	—	1,740	1,050	—
Distillery »	—	200	—	—	—	—	—	288	—	—	316	—	300	—	—	2,640	2,175	—	400	—	—
Locomotives»	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lime Kiln »	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Factory: Wood/Ton 96° Sugar .. .. »	—	0·24	—	—	—	—	0·01	0·15	—	—	0·04	0·03	0·02	0·12	—	0·09	0·04	—	0·36	—	—
Filter Cake .. »	20,698	1,004	2,363	17,897	4,201	4,107	2,027	1,273	1,833	977	4,840	5,018	5,108	1,937	1,749	1,795	3,682	4,302	530	842	86,183
Molasses																					
Equiv. 88° Brix .. Gls.	4,135,547	258,180	844,500	3,833,220	964,739	580,102	770,828	312,984	317,062	265,293	707,135	979,777	625,607	330,169	364,446	613,692	642,963	775,173	216,872	319,161	17,857,450
Sugar Made																					
"A" Grade Tons	—	—	—	—	—	—	—	—	—	—	—	—	455·00	—	—	—	—	—	—	—	455·00
"C" Grade .. .. »	—	—	—	—	—	2910·60	401·00	850·00	2500·00	—	450·00	—	3589·50	—	—	—	—	—	—	—	10701·10
"D" Grade .. »	—	2600·00	360·00	3800·00	1225·00	5200·40	—	1700·00	2170·00	—	2900·00	1250·00	3345·50	—	400·00	3900·00	600·00	3193·00	1800·00	400·00	34843·90
Refined .. .. »	14000·00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14000·00
Total Local Consumptn. »	14000·00	2600·00	360·00	3800·00	1225·00	8111·00	401·00	2550·00	4670·00	—	3350·00	1250·00	7390·00	—	400·00	3900·00	600·00	3193·00	1800·00	400·00	60000·00
Substitution .. »	229·00	—	2470·00	9969·00	2118·00	—	2017·00	—	—	1087·00	—	1847·00	—	1513·00	1100·00	—	1795·00	—	—	822·00	24967·00
Export .. .. »	45201·50	3285·50	14106·90	70000·00	16665·50	4830·00	12050·00	5009·10	6602·50	5419·10	9621·00	15438·10	7886·00	7543·00	7476·00	6758·40	11938·00	15216·30	2960·70	6092·40	274100·00
Official Crop Production »	59430·50	5885·50	16936·90	83769·00	20008·50	12941·00	14468·00	7559·10	11272·50	6506·10	12971·00	18535·10	15276·00	9056·00	8976·00	10658·40	14333·00	18409·30	4760·70	7314·40	359067·00
Lime Burnt .. Lbs.	3,010,560†	85,120	183,993	885,942	287,000	142,952	106,355	37,879	83,543	39,901	146,048	244,904	129,405	116,783	114,492	67,660	134,244	236,048	45,412	134,400	6,232,641
Phosphate .. »	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Superphosphate »	—	5,824	—	—	—	—	—	—	41,664	—	—	—	—	—	—	—	—	—	—	—	47,488
Tri-Sodium Phosphate Lbs.	—	—	—	23,306	—	—	134	—	—	—	—	—	—	—	—	—	—	—	—	—	23,440

* Includes 8·32 tons ground for Worthy Park Estate.

† Used for Raw and Refined Sugar Production.

TABLE IV

FACTORY ANALYTICAL DATA—1957 CROP

	Mony-musk	Rich-mond/ Llan-dovery	Jamaica Sugar Estates	Frome	New Yar-mouth	Cay-manas	Inns-wood	Bar-nett	Worthy Park	Rose Hall	Gray's Inn Central	Sevens	By-brook	Serge Island	Vale Royal	Apple-ton	Hamp-den	Ber-nard Lodge	Holland	Long Pond	Totals and Averages
Cane																					
Pol %	11·76	12·77	12·29	12·06	12·42	12·69	12·75	13·07	14·59	12·63	11·96	12·43	13·26	13·31	12·58	12·77	13·14	13·18	12·86	12·12	12·43
Fibre %	13·30	13·95	15·24	13·67	15·15	12·91	16·21	14·68	13·03	15·31	17·56	14·49	13·80	14·70	14·74	13·43	14·84	14·91	13·14	14·38	14·25
Bagasse																					
Pol %	2·28	2·15	2·77	2·45	2·65	2·19	2·91	2·76	2·52	2·86	1·83	2·98	2·68	2·87	2·54	2·76	3·35	2·94	3·23	3·77	2·60
Moisture %	52·16	46·91	43·35	48·42	47·38	46·44	48·57	46·42	45·67	45·82	45·23	48·91	45·79	46·46	46·22	45·84	46·50	49·03	45·63	47·20	48·08
Juices																					
First Exp. °Brix ..	18·35	19·22	18·28	17·87	19·27	18·25	19·97	19·64	20·41	19·24	19·69	18·76	19·10	19·73	18·95	18·59	19·28	20·21	18·66	18·49	18·75
Pol % ..	14·63	16·42	15·46	15·04	16·13	15·36	16·78	17·06	18·23	16·50	16·29	15·83	16·56	17·32	16·17	16·10	16·62	17·37	15·75	15·71	15·75
App. Purity ..	79·73	85·43	84·57	84·16	83·71	84·16	84·03	86·86	89·32	85·76	82·75	84·38	86·70	87·78	85·33	86·61	86·20	85·95	84·41	84·96	84·01
Absolute °Brix ..	17·42	17·83	17·65	16·99	18·02	17·50	18·54	18·14	19·28	18·09	18·25	17·74	18·13	18·20	17·71	17·53	18·48	18·57	18·02	17·09	17·70
App. Purity ..	77·86	83·23	82·16	82·22	81·26	83·30	82·04	84·45	87·03	82·42	79·51	81·96	84·89	85·76	83·34	84·14	83·60	83·41	82·17	82·80	81·89
Mixed °Brix ..	16·96	16·07	15·71	15·10	16·45	15·20	16·36	16·62	16·88	15·45	16·94	15·40	15·68	16·81	15·62	15·58	16·45	16·00	15·99	15·17	15·96
App. Purity ..	78·13	83·54	82·65	82·72	81·71	83·59	82·46	84·90	87·32	83·24	80·07	82·30	85·27	86·08	83·67	84·47	84·13	83·76	82·36	83·26	82·29
R.S. Pol Ratio ..	9·40	7·89	8·77	8·97	7·88	6·56	7·78	5·95	4·41	5·24	7·42	7·73	7·48	6·98	8·03	7·50	—	6·53	8·35	9·60	8·09
Last Exp. °Brix ..	4·52	3·32	5·99	4·57	4·69	4·53	5·86	5·06	4·05	4·44	5·82	5·67	3·58	6·70	4·60	4·78	5·98	6·17	9·37	8·06	—
App. Purity ..	73·55	77·34	75·79	74·77	75·50	77·22	77·99	79·61	80·74	73·53	70·40	77·71	78·36	80·61	79·01	78·88	77·53	79·09	79·42	78·84	—
Evaporator Supply																					
°Brix ..	16·48	16·49	15·22	15·35	16·30	14·25	16·09	17·07	17·02	15·79	16·48	15·29	15·66	17·21	15·65	15·95	16·67	15·95	15·94	15·54	—
App. Purity ..	79·17	83·69	83·31	83·06	82·58	81·07	82·62	85·78	88·31	84·07	80·33	83·15	86·01	86·35	84·98	85·58	84·09	85·20	82·94	83·79	—
Syrup °Brix ..	57·76	61·24	62·14	54·43	60·36	61·39	57·20	57·67	53·11	58·97	59·52	62·06	69·14	53·33	62·05	57·57	60·91	62·26	62·43	52·49	—
App. Purity ..	78·85	84·22	83·96	84·13	82·11	81·85	82·97	86·22	89·25	85·12	81·61	84·20	86·42	86·76	85·48	86·36	85·15	86·01	83·41	84·00	—
Filter Cake Pol % ..	1·87	4·55	4·41	1·03	3·44	1·57	2·31	2·52	4·45	2·89	2·15	1·69	1·83	3·57	2·01	1·77	2·87	2·24	5·73	5·21	2·11
Moisture % ..	77·53	74·48	—	77·43	75·18	75·36	72·71	72·27	58·34	72·27	57·94	75·32	76·50	78·91	61·41	75·91	69·72	72·09	60·90	—	74·14
Sugars																					
(Export) Pol % ..	97·09	—	—	96·75	97·71	97·52	97·20	97·80	97·12	97·12	97·33	97·54	97·58	97·32	97·19	97·01	98·02	97·72	97·12	97·22	—
(All) Pol %	97·77	96·46	97·56	96·74	97·82	97·52	97·21	97·85	97·43	97·12	97·15	97·50	97·62	97·32	97·18	96·94	98·00	97·74	96·91	97·22	97·34
(Export) Moisture % ..	0·67	—	—	0·73	0·60	0·80	0·85	0·80	1·00	0·85	0·80	0·64	0·72	0·96	0·68	0·84	0·91	—	0·84	0·64	—
(All) Moisture % ..	0·51	0·94	0·90	0·74	—	—	0·85	0·80	1·00	0·85	0·80	0·64	0·73	—	0·68	0·84	0·91	—	0·83	0·64	—
Final Molasses																					
°Brix	92·27	86·63	88·29	91·53	91·24	88·78	88·12	87·65	95·05	87·87	89·53	89·56	89·56	87·30	85·70	84·43	87·55	91·45	84·78	86·96	90·39
App. Purity	36·89	33·01	31·88	31·02	33·73	33·43	35·81	30·67	34·84	33·75	31·49	30·53	31·42	35·13	32·29	31·80	31·07	37·82	36·03	31·76	33·52

TABLE V

Factory Control Data—1957 Crop

	Mony-musk	Rich-mond/ Llan-dovery	Jamaica Sugar Estates	Frome	New Yar-mouth	Cay-manas	Inns-wood	Bar-nett	Worthy Park	Rose Hall	Gray's Inn Central	Sevens	By-brook	Serge Island	Vale Royal	Apple-ton	Hamp-den	Ber-nard Lodge	Holland	Long Pond	Totals and Averages
Control Classification																					
Cane																					
Fibre/Pol Ratio	1·13	1·09	1·24	1·13	1·22	1·02	1·27	1·12	0·89	1·21	1·47	1·17	1·04	1·10	1·17	1·05	1·13	1·13	1·02	1·19	1·15
Tons Cane/Ton 96° Sugar ..	10·16	8·77	9·33	9·23	9·46	8·94	9·25	8·64	7·67	9·05	9·65	9·39	8·39	8·47	8·90	9·44	8·84	8·93	9·10	9·62	9·26
Demarara Index	21·92	21·54	21·62	21·29	21·88	21·63	22·00	21·71	22·26	21·68	21·61	21·82	21·65	21·78	21·48	22·21	21·98	22·11	21·96	21·74	21·69
Java Ratio	80·38	77·77	79·50	80·19	77·00	82·61	75·98	76·61	80·03	76·55	73·42	78·52	80·07	76·85	77·80	79·32	79·06	75·88	81·65	77·15	78·92
Milling																					
Tons Cane/Hour	162·34	29·93	71·70	182·94	61·03	41·41	41·94	31·76	32·83	27·78	51·58	67·28	45·96	35·83	35·67	46·52	53·88	77·41	18·57	27·33	64·34
Tons Fibre/Hour	21·59	4·17	10·93	25·01	9·25	5·35	6·80	4·66	4·28	4·25	9·06	9·75	6·34	5·27	5·26	6·11	8·00	11·54	2·44	3·93	9·17
Imbibition % Cane	13·34	18·35	17·29	19·33	17·20	20·84	21·18	16·24	20·05	21·92	17·33	21·52	20·92	15·56	19·76	17·98	17·95	22·93	17·38	16·92	18·20
Imbibition % Fibre	100·30	131·55	113·46	141·40	113·51	161·43	130·68	110·65	153·82	143·17	98·72	148·55	151·58	105·84	134·08	133·94	120·95	153·74	132·23	117·63	127·71
Pol Extraction	94·23	95·33	93·52	94·25	93·42	95·63	92·26	93·82	95·60	93·10	94·85	92·65	94·51	93·67	94·11	94·28	92·27	92·95	93·43	90·70	93·86
Reduced Pol Extraction ..	94·63	95·89	94·85	94·81	94·74	95·79	94·28	94·87	95·80	94·55	96·55	93·80	95·10	94·75	95·13	94·73	93·66	94·25	93·80	92·09	94·72
Absolute Juice Lost % Fibre ..	37·61	28·80	36·04	36·31	36·85	29·48	40·01	35·92	29·37	38·17	24·18	43·37	34·29	36·73	34·07	36·87	44·36	40·23	43·43	55·37	36·95
Bagasse % Cane	29·73	27·73	28·75	28·27	30·84	25·29	33·97	29·33	25·45	30·44	33·70	30·66	27·17	29·41	29·16	26·50	31·17	31·56	26·13	29·92	29·37
Time Grinding % Gross G.T. ..	67·22	68·68	65·10	89·00	76·29	78·04	76·47	77·12	70·15	77·45	59·25	64·82	80·07	62·89	70·71	77·80	69·92	60·61	61·56	81·89	71·69
Purity Drop																					
First Expressed—Mixed ..	1·60	1·89	1·92	1·44	2·00	—	1·57	1·96	2·00	2·52	2·68	2·08	1·43	1·70	1·66	2·14	2·07	2·19	2·05	1·70	1·72
First Expressed—Last Expressed	6·18	8·09	8·78	9·39	8·21	6·94	6·04	7·25	8·58	12·23	12·35	6·67	8·34	7·17	6·32	7·73	8·67	6·86	4·99	6·12	—
Boiling House																					
Tons Brix/Hour..	23·01	4·36	9·97	25·14	8·67	6·01	5·98	4·59	5·24	3·93	7·31	9·42	6·76	5·19	5·05	6·49	7·42	11·32	2·71	3·61	9·12
Tons 96° Sugar/Hour	15·97	3·41	7·68	19·80	6·45	4·63	4·53	3·67	4·28	3·07	5·35	7·17	5·47	4·23	4·01	4·82	5·82	8·67	2·04	2·84	6·95
Filter Cake % Cane	3·37	1·93	1·47	2·30	2·18	3·48	1·49	1·91	2·08	1·63	3·82	2·84	3·92	2·49	2·16	1·77	2·85	2·57	1·21	1·18	2·55
Gallons Final Molasses at 88° Brix/Ton 96° Sugar ..	68·33	43·66	49·06	45·41	47·32	43·98	52·48	40·52	27·71	40·04	53·87	52·05	40·28	35·96	40·10	57·02	43·91	41·36	45·13	42·91	—
Efficiency (W.C.)	96·05	97·61	97·65	99·76	96·02	96·02	96·33	97·50	95·29	98·06	97·41	97·09	98·01	97·16	98·83	91·22	96·91	95·18	96·02	98·70	97·22
Purity Rise: Mixed—Syrup ..	0·72	0·68	1·31	1·41	0·40	—	0·51	1·32	1·93	1·88	1·54	1·90	1·15	0·68	1·81	1·89	1·02	2·25	1·05	0·74	—
Pol Balance (In Cane)																					
% in Sugars		85·72	83·66	86·21	81·67	84·62	81·41	84·97	85·80	83·95	83·19	82·24	86·23	85·13	85·75		82·62	81·61	82·02	82·31	83·39
% in Molasses	See	7·40	7·86	7·29	7·83	7·46	9·20	6·33	5·37	6·79	8·60	7·83	6·67	6·39	6·65	See	6·77	7·66	7·82	6·71	8·06
% in Filter Cake	foot-	0·69	0·53	0·19	0·60	0·43	0·27	0·37	0·64	0·37	0·69	0·39	0·54	0·67	0·34	foot-	0·62	0·44	0·54	0·51	0·43
% in Bagasse	note	4·67	6·48	5·75	6·58	4·37	7·74	6·18	4·40	6·90	5·15	7·35	5·49	6·33	5·89	note	7·73	7·05	6·57	9·30	6·14
Undetermined		1·52	1·47	0·56	3·32	3·12	1·38	2·15	3·79	1·99	2·37	2·19	1·07	1·48	1·37		2·26	3·24	3·05	1·17	1·98

Monymusk's Pol Balance to read:— % in Sugars .. .. 80·36; % in Final Molasses .. 11·81; % in Filter Cake .. .. 0·51; % due to Labour Dispute 0·09; % in Refinery Filter Cake 0·01; % in Refinery Molasses .. 0·36; % in Refinery Undetermined 0·19; % in Bagasse .. .. 5·77; % Unaccounted for .. 0·90

Appleton's Pol Balance to read:— % in Sugars .. .. 79·67; % in "C" Molasses .. .. 3·40; % in "B" Molasses .. .. .. 8·46; % in Cloudy Juice, Syrup & Clarified 0·44; % in Filter Cake .. 0·25; % in Bagasse .. 5·72; % Undetermined .. 2·06

TABLE VI

NON-FACTORY STOPPAGES AND TIME GRINDING % GROSS GRINDING TIME. 1957 CROP

(As Reported by the Factories)

Factories	Field stoppages	Premeditated	Rain	Labour	Week-end	Nett grinding time	Time grinding
Monymusk	7·75	0·79	—	19·60	3·82	68·04	67·22
Richmond-Llandovery	4·56	1·39	—	—	7·05	87·00	68·68
Jamaica Sugar Estates	11·93	3·12	—	3·17	7·58	74·20	65·10
Frome	1·06	3·99	—	—	2·98	91·97	89·00
New Yarmouth	5·50	3·05	5·20	1·44	7·06	77·75	76·29
Caymanas	2·53	1·03	—	6·04	5·32	85·08	78·04
Innswood	4·18	3·33	—	—	8·23	84·26	76·47
Barnett	3·60	5·20	—	—	7·75	83·45	77·12
Worthy Park	0·54	0·95	—	17·72	4·85	75·94	70·15
Rose Hall	0·98	1·86	—	—	11·73	85·43	77·45
Gray's Inn Central	2·85	—	—	22·35	9·56*	65·24	59·25
Sevens	4·22	2·00	—	17·80	4·75	71·23	64·82
Bybrook	7·72†	1·75	—	—	5·70	84·83	80·07
Serge Island	5·11	3·65	—	—	7·95	83·29	62·89
Vale Royal	6·43	2·71	—	—	8·30	82·56	70·71
Appleton	2·55	1·46	—	1·08	7·02	87·89	77·80
Hampden	8·62	4·65	—	2·45	5·33	78·95	69·92
Bernard Lodge	3·33	1·12	3·87	24·95	3·05	63·68	60·61
Holland	6·87	2·54	—	—	6·30	84·29	61·56
Long Pond	0·54	3·07	—	—	9·25	87·14	81·89
Island Averages	4·61	2·34	0·48	6·57	6·47	79·53	71·69

* Includes Premeditated Stoppages. † Large portion of Field Stoppages due to Labour Disputes.

NOTE.—Gross Grinding Time = Interval between commencement and termination of milling.
Nett Grinding Time = Possible Grinding Time
Time Grinding = Actual Grinding Time.

TABLE VII

FACTORY STOPPAGES AND TIME GRINDING % NETT GRINDING TIME

Factories	Machinery	Chokes	Juice room	Steam	Electrical	Washing	Other reasons	Time grinding
Monymusk	1·08	0·04	—	0·07	—	—	—	98·81
Richmond-Llandovery	11·27	1·35	4·51	2·54	—	—	1·39	78·94
Jamaica Sugar Estates	9·72	0·29	—	—	—	—	2·24*	87·75
Frome	1·82	0·34	—	0·35	0·11	—	0·62	96·76
New Yarmouth	1·69	0·06	—	0·04	0·01	—	0·07	98·13
Caymanas	4·46	0·22	2·52	0·05	—	0·39	0·64	91·72
Innswood	6·45	0·93	0·18	0·36	—	0·44	0·90	90·74
Barnett	5·59	0·52	0·53	0·54	—	—	0·40	92·42
Worthy Park	5·80	0·03	0·60	0·56	—	—	0·64	92·37
Rose Hall	6·19	0·52	0·93	1·37	—	—	0·33	90·66
Gray's Inn Central	3·22	0·68	3·43	0·41	—	—	1·44	90·82
Sevens	4·85	0·11	0·46	0·51	—	—	3·07	91·00
Bybrook	3·32	1·00	0·12	0·23	0·28	—	0·67	94·38
Serge Island	13·19	0·33	2·21	3·96	—	—	4·81	75·50
Vale Royal	7·83	0·39	0·38	0·44	—	0·41	4·90	85·65
Appleton	9·16	1·60	0·13	0·09	—	—	0·51	88·51
Hampden	5·83	1·09	3·14	0·15	—	—	1·23	88·56
Bernard Lodge	3·82	—	—	—	—	—	0·99	95·19
Holland	22·02	0·47	1·53	2·41	—	—	0·53	73·04
Long Pond	3·06	0·64	1·52	0·05	—	—	0·76	93·97
Island Averages	6·30	0·51	1·04	0·68	0·02	0·07	1·25	90·13

* Includes Steam.

SUMMARY

Time Grinding	52654·13 Hours		
Factory Stoppages	5761·19	»	= 7·84% Gross Grinding Time.
Nett Grinding Time	58415·32 Hours		
Non-Factory Stoppages	15032·59	»	= 20·47% Gross Grinding Time.
Gross Grinding Time	73448·31 Hours		

DISTILLERY DATA—1957 CROP

TABLE I

Distillery Capacities

		Mony-musk	Rich-mond/ Llan-dovery	Jamaica Sugar Estates	Frome	New Yar-mouth	Cay-manas	Inns-wood	Bar-nett	Worthy Park	Rose Hall	Gray's Inn Central	Sevens	By-brook	Serge Island	Vale Royal	Apple-ton	Hamp-den	Bernard Lodge	Holland	Long Pond	Totals and Averages
Fermentation																						
Vats	No. of	30	40	9	43	37	15	30	17	10	13	9	21	15	10	20	22	56	44	14	90	545
Total Capacity	gal.	362,000	50,900	125,000	171,800	61,500	75,000	71,943	36,000	20,000	39,000	90,000	35,546	42,600	70,000	34,230	82,800	98,000	132,000	12,600	174,000	1,784,919
Dunder Boxes	No. of	4	10	6	7	5	2	4	10	5	12	—	5	4	3	3	—	5	12	3	13	118
Total Capacity	gal.	12,000	20,000	65,000	19,600	5,500	42,400	10,000	1,000	9,000	14,400	—	18,233	7,000	10,000	8,800	—	10,000	36,000	2,500	12,000	303,433
Cooling Surface	sq. ft.	—	—	150	—	—	—	—	—	—	—	—	957	—	—	—	—	840	—	—	—	1,947
Distillation																						
Wash Preheater	No. 1																					
Capacity	gal.	2,200	1,500	—	3,800	4,000	3,000	—	Tubular	1,500	—	Cont.	—	1,300	—	850	300	—	3,000	—	—	21,450
	sq. ft. H.S.	135	831	—	166	—	100	—	—	—	—	330	—	60	—	40	—	—	250	—	—	1,912
	No. 2																					
Capacity	gal.	2,200	1,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,700
	sq. ft. H.S.	135	585	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	720
Still No. 1																						
Loading Capacity	gal.	2,000	1,500	2,500	1,200	1,500	1,500	2,500	1,800	1,300	1,500	—	1,780	1,237	1,500	1,500	1,500	2,000	1,380	1,000	1,200	30,397
	sq. ft. H.S.	135	—	104	72	150	105	—	200	65	100	—	188	240	200	80	90	—	112	—	—	—
L.W. retort charge	gal.	250	180	350	150	180	175	300	220	150	180	—	230	140	175	100	180	250	168	120	120	3,618
	sq. ft. H.S.	—	—	4·2	—	—	3·6	—	—	—	—	—	—	4·0	—	—	—	—	—	—	—	—
H.W. retort charge	gal.	200	150	240	120	150	150	250	180	120	120	—	190	120	140	64	150	200	140	100	100	2,884
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	4·0	—	—	—	—	—	—	—	—
Condenser	sq. ft. C.S.	—	2,660	766	—	—	—	—	470	—	—	—	355	752	220	—	—	—	—	—	—	—
Still No. 2																						
Loading Capacity	gal.	2,000	1,500	2,500	2,000	1,500	1,500	—	—	—	1,500	—	1,780	1,237	3,500	1,500	1,400	1,500	1,380	—	800	25,597
	sq. ft. H.S.	135	—	104	120	150	105	—	—	—	95	—	136	98	98	80	108	—	112	—	—	—
L.W. retort charge	gal.	250	180	350	240	180	175	—	—	—	180	—	230	140	350	100	160	200	168	—	100	3,003
	sq. ft. H.S.	—	—	4·2	—	—	3·6	—	—	—	—	—	—	4·0	—	—	—	—	—	—	—	—
H.W. retort charge	gal.	200	150	240	220	150	150	—	—	—	120	—	190	120	280	64	140	150	140	—	80	2,394
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	4·0	—	—	—	—	—	—	—	—
Condenser	sq. ft. C.S.	—	1,916	766	—	—	—	—	—	—	—	—	351	752	185	—	—	—	—	—	—	—
Still No. 3																						
Loading Capacity	gal.	2,000	—	2,500	1,800	1,200	—	—	—	—	—	—	—	—	—	—	1,400	1,500	1,380	—	1,500	13,280
	sq. ft. H.S.	135	—	104	86	115	—	—	—	—	—	—	—	—	—	—	108	—	112	—	—	—
L.W. retort charge	gal.	250	—	350	240	140	—	—	—	—	—	—	—	—	—	—	160	200	168	—	150	1,658
	sq. ft. H.S.	—	—	4·2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H.W. retort charge	gal.	200	—	240	220	120	—	—	—	—	—	—	—	—	—	—	140	150	140	—	180	1,390
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condenser	sq. ft. C.S.	—	—	766	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Still No. 4																						
Loading Capacity	gal.	2,000	—	—	1,800	1,500	—	—	—	—	—	—	—	—	—	—	1,200	1,000	1,500	—	—	9,000
	sq. ft. H.S.	135	—	—	88	150	—	—	—	—	—	—	—	—	—	—	65	—	125	—	—	—
L.W. retort charge	gal.	250	—	—	240	180	—	—	—	—	—	—	—	—	—	—	150	150	180	—	—	1,150
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H.W. retort charge	gal.	200	—	—	220	150	—	—	—	—	—	—	—	—	—	—	130	80	150	—	—	930
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condenser	sq. ft. C.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Still No. 5																						
Loading Capacity	gal.	—	—	—	2,000	—	—	—	—	—	—	—	—	—	—	—	2,000	—	2,000	—	—	6,000
	sq. ft. H.S.	—	—	—	120	—	—	—	—	—	—	—	—	—	—	—	171	—	150	—	—	—
L.W. retort charge	gal.	—	—	—	240	—	—	—	—	—	—	—	—	—	—	—	275	—	250	—	—	765
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H.W. retort charge	gal.	—	—	—	220	—	—	—	—	—	—	—	—	—	—	—	220	—	200	—	—	640
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condenser	sq. ft. C.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Still No. 6																						
Loading Capacity	gal.	—	—	—	2,000	—	—	—	—	—	—	—	—	—	—	—	2,000	—	—	—	—	4,000
	sq. ft. H.S.	—	—	—	120	—	—	—	—	—	—	—	—	—	—	—	171	—	—	—	—	291
L.W. retort charge	gal.	—	—	—	240	—	—	—	—	—	—	—	—	—	—	—	275	—	—	—	—	515
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H.W. retort charge	gal.	—	—	—	220	—	—	—	—	—	—	—	—	—	—	—	220	—	—	—	—	440
	sq. ft. H.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Condenser	sq. ft. C.S.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Continuous Still																						
No. of columns		2	—	—	2	—	1	2	—	—	—	1	—	—	—	—	4	—	—	—	—	12
Wash/24 hours	gal.	48,000	—	—	5,000	—	40,000	40,000	—	—	—	40,000	—	—	—	—	10,800	—	—	—	—	183,800

TABLE II

Distillery Quantities

		Monymusk (Rum)	Richmond/ Llandovery	Frome	New Yarmouth	Caymanas	Innswood	Barnett	Worthy Park	Rose Hall	Gray's Inn Central
Cane Juice Used	tons	229	—	387	—	—	—	—	—	—	—
	gal.	48,000	—	81,719	—	—	—	—	—	—	—
Total Sugars as R.S.	lb.	82,702	—	123,491	—	—	—	—	—	—	—
Molasses Used	tons	3,366	1,344	6,486	2,577	—	5,427	886	1,403	740	4,237
	gal.	—	206,588	973,500	387,466	—	840,313	315,064	206,773	113,159	641,340
Equivalent 88° Brix	gal.	541,740	203,372	1,030,411	407,965	—	818,631	312,984	214,243	112,902	522,890
Total Sugars as R.S.	lb.	4,439,124	1,701,974	9,479,187	3,309,798	—	7,377,679	1,091,195	—	948,460	5,674,291
Total Sugars used as R.S.	lb.	4,439,124	1,701,974	9,602,678	3,309,798	—	—	1,091,195	—	948,460	4,586,316
Wash: Set	gal.	3,756,000	1,405,500	6,726,000	1,937,470	2,178,400	6,113,019	672,200	—	723,000	4,793,394
Distilled	gal.	3,710,000	1,404,000	6,525,000	1,922,680	2,052,900	5,095,399	577,600	—	669,200	3,951,709
Rum as Distilled											
Bulk	gal.	185,912	57,145	348,661	133,293	72,672	217,003	38,813	—	30,807	—
Proof	gal.	258,789	78,574	488,125	187,492	—	349,573	54,338	—	45,436	—
As Packaged Bulk	gal.	—	55,299	344,093	—	—	246,829	—	—	31,297	—
Alcohol as Distilled											
Bulk	gal.	—	—	—	—	11,203	—	—	—	—	176,746
As Packaged Bulk	gal.	—	—	—	—	—	—	—	—	—	—
As Distilled Proof	gal.	—	—	—	—	—	—	—	—	—	294,923
Absolute Alcohol	gal.	—	—	—	—	—	—	—	—	—	168,284
Anhydrous Alcohol	gal.	—	—	—	—	—	—	—	—	—	—

TABLE II—*continued*

		Sevens	Bybrook	Serge Island	Vale Royal	Appleton	Hampden	Bernard Lodge	Holland	Long Pond	Monymusk (Alc.)
Cane Juice Used	tons	—	—	—	135	2,247	5,511	—	—	4,830	—
	gal.	—	—	—	28,145	480,373	1,157,193	—	—	902,587	—
Total Sugars as R.S.	lb.	—	—	—	45,761	2,483,053	—	—	—	1,573,417	—
Molasses Used	tons	2,095	1,927	1,002	2,505	4,287	—	4,157	254	1,363	1,657
	gal.	320,280	294,000	153,848	386,597	703,005	583,627	623,845	39,376	209,258	—
Equivalent 88° Brix	gal.	321,124	294,000	153,286	373,027	572,119	582,251	658,948	37,935	205,494	266,970
Total Sugars as R.S.	lb.	2,811,865	2,405,998	1,323,880	1,517,735	2,689,974	—	5,556,115	—	1,710,684	2,207,638
Total Sugars used as R.S.	lb.	2,792,406	2,405,998	1,323,880	1,563,502	5,173,027	—	5,556,115	—	3,284,101	2,207,638
Wash: Set	gal.	2,069,770	1,640,232	1,003,435	1,179,000	4,787,900	2,659,500	4,369,900	184,500	1,924,000	1,886,000
Distilled	gal.	2,057,450	1,640,232	1,003,435	1,179,000	—	—	4,287,410	177,300	1,924,000	1,858,000
Rum as Distilled											
Bulk	gal.	75,531	84,959	48,851	58,913	244,304	142,088	225,861	8,295	105,140	—
Proof	gal.	111,342	127,014	72,881	82,784	370,476	196,081	334,274	12,286	155,606	—
As Packaged Bulk	gal.	—	91,411	—	57,098	250,522	137,040	222,930	8,443	108,479	—
Alcohol as Distilled											
Bulk	gal.	—	—	—	—	45,196	—	—	—	—	75,160
As Packaged Bulk	gal	—	—	—	—	41,965	—	—	—	—	—
As Distilled Proof	gal.	—	—	—	—	75,928	—	—	—	—	104,623
Absolute Alcohol	gal.	—	—	—	—	43,355	—	—	—	—	—
Anhydrous Alcohol	gal.	—	—	—	—	—	—	—	—	—	—

TABLE III

Distillery Analytical and Control Data

	Monymusk (Rum)	Frome	New Yarmouth	Innswood	Barnett	Gray's Inn Central	Sevens	Bybrook	Serge Island	Vale Royal	Bernard Lodge	Long Pond	Monymusk (Alc.)
Cane Juice													
Total Sugars as R.S. %	16·06	14·25	—	—	—	—	—	—	—	15·09	—	14·54	—
°Brix	17·74	14·96	—	—	—	—	—	—	—	18·49	—	15·27	—
Molasses													
Total Sugars as R.S. %	58·88	65·25	57·33	61·42	55·00	59·73	59·23	55·76	58·98	59·05	59·64	56·02	59·46
°Brix	92·87	91·57	91·24	85·32	87·65	89·11	88·06	89·14	87·30	85·70	91·44	86·74	92·94
Dunder													
°Brix	12·45	13·37	11·85	9·24	13·54	—	—	15·26	13·30	14·13	13·76	19·15	—
% Acidity (as Acetic)	1·60	2·10	—	1·22	1·76	—	—	1·12	1·26	1·31	1·50	3·15	—
pH	—	—	3·90	—	—	—	—	—	—	—	—	—	—
Live Wash													
°Brix	17·46	18·40	18·05	16·18	19·50	16·64	17·14	18·40	17·82	17·50	18·38	20·87	17·15
Total Sugars as R.S. %	11·23	13·27	11·22	13·58	10·15	11·12	10·57	11·51	11·08	10·12	11·82	11·78	10·94
% Acidity (as Acetic)	0·66	0·54	—	0·92	1·44	—	0·63	0·33	0·33	0·66	0·62	1·32	0·65
pH	—	—	4·47	—	—	5·20	—	—	—	—	—	—	—
Dead Wash													
%Brix	9·81	8·73	8·40	6·30	9·00	7·40	8·16	9·50	8·60	9·56	8·19	11·14	9·18
Total Sugars as R.S. %	0·92	1·03	1·19	1·13	1·02	0·65	1·28	1·21	—	1·19	1·07	1·06	1·09
% Acidity (as Acetic)	1·40	1·58	—	1·33	1·31	—	1·44	0·90	0·98	1·47	1·23	2·41	1·27
pH	—	—	4·07	—	—	4·10	—	—	—	—	—	—	—
% Proof Spirit	7·30	8·98	10·08	6·85	9·97	7·87	8·19	8·44	8·01	7·35	8·80	9·09	6·80
Rum													
Overproof	—	40·00	40·00	61·09	40·00	66·86	47·41	49·50	49·18	48·00	48·00	48·00	—
Fermentation													
Attenuation °Brix	7·65	9·67	9·65	9·88	10·50	9·24	8·98	8·90	9·22	7·94	10·19	9·73	7·97
% Conversion	91·81	92·24	89·39	91·68	89·95	94·15	87·89	89·49	—	88·24	90·95	91·00	90·04
Lbs. R.S./gal. Abs. Alc. in Wash	28·39	27·88	29·93	36·80	33·21	25·83	30·86	30·44	28·87	31·75	25·32	32·91	30·18
Distillation													
Gals. Abs. Alc. in Dist./gal. Abs. Alc. in Wash	0·95	0·83	0·97	1·00	0·94	0·95	0·70	0·92	0·91	0·96	0·89	0·90	0·83
Overall													
Lbs. R.S./gal. Abs. Alc. in Dist.	30·64	34·48	30·94	36·99	35·19	27·25	43·95	33·20	31·83	33·10	29·13	36·98	37·00
Recovery % Theoretical	50·20	45·04	49·71	41·58	43·71	56·44	34·99	46·33	48·32	46·46	52·80	41·58	41·57
Lbs. R.S./gal. Proof Alc. in Dist.	17·15	19·67	17·65	21·10	20·08	15·55	25·08	18·94	18·17	18·89	16·62	21·10	21·10
Gals. Mol. at 88° Brix/gal. Proof Alc.	2·09	2·11	2·18	2·34	2·48	1·77	2·88	2·31	2·10	2·04	1·97	1·32	2·55

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